iZotope Ozone 5 Help Documentation

Table of Contents

Introduction 1
Welcome to Ozone 5 1
Authorization 2
What is Ozone? 11
New Features in Ozone 5 13
Getting Started 15
Mastering Modules 17
Standard Module Controls 17
Using Multiband Modules 20
Mid-Side Processing 25
Equalizer 28
Matching EQ 37
Mastering Reverb 40
Harmonic Exciter 45
Dynamics 49
Stereo Imaging 58
Maximizer 61
Dithering 66
Meter Bridge [Ozone Advanced] 69
Mastering Meters 80
Spectrum Analyzer 80
Correlation Meter 83
Vectorscope 84
Dynamics Meters 87
Input and Output Meters 91
Dithering Meters 98
Preset System 101
Preset Manager 101
Selecting Presets 103
Adding and Removing Presets 105
Changing Where Presets Are Stored 107
Module Preset System 108

Migrating Presets from Ozone 4 110
General Functions 112
Setting the Order of the Mastering Modules 112
Input and Output Gain 115
Undo and History Comparisons 117
Gain when Bypassed Function 118
Buffer Size Viewer 119
Options 120
General Options 120
Spectrum Options 123
I/O Options 125
EQ Options 127
Reverb Options 129
Exciter Options 130
Imager Options 131
Dynamics Options 133
Maximizer Options 135
Tips and Shortcuts 136
CPU Optimization 136
Buffer Sizes 137
Automation 139
Shortcut Keys and Mouse Support 141
iZotope Customer Support 145

Introduction
Welcome to Ozone 5

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V 5.0.3.733

Authorization

Each purchased copy of Ozone 5 contains a unique serial number printed on the installer DVD sleeve. If Ozone 5 has been downloaded directly from iZotope or another re-seller the serial number will be e-mailed along with the link to download the product. The serial number should resemble:

SN-OZONE5-XXXX-XXXX-XXXX-XXXX

Launching the Authorization Wizard

The first time you open Ozone 5, the Authorization Wizard will appear. You can choose to either authorize Ozone or use it in Trial mode for evaluation purposes. Please use your supplied Ozone 5 serial number to fully authorize your product.

Trial vs. Demo Mode

For the first 10 days after installation, Ozone will run in Trial mode, which offers full functionality with the exception of saving and batch processing. After 10 days, Ozone will revert to Demo mode. In Demo mode, Ozone will intermittently mute audio output. You may alternate your Trial/Demo of Ozone 5 between Basic and Advanced versions with the 'Choose Demo:' drop-down menu under 'Auth & Updates' in the General Options tab.

Authorizing Your Copy of Ozone 5 Online

After opening Ozone 5 and launching the Authorization Wizard, the following steps will complete the authorization process online:

1. First, click on 'Authorize'.

iZotope Authorization
iZotope AUTHORIZATION
iZotope Ozone 5 v5.00.554
Thank you for continuing your evaluation of iZotope Ozone 5. If you have already purchased Ozone, click Authorize to authorize the product. To continue using this demonstration version, click the Demo button.
For details on purchasing Ozone, please visit the iZotope website:
http://www.izotope.com/store/purchase.asp
Authorize
Demo
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/authfaq.html

2. Next, enter the serial number in all capital letters as it it shown on your DVD sleeve or e-mailed to you.

SN-OZONE5-XXXX-XXXX-XXXX-XXXX

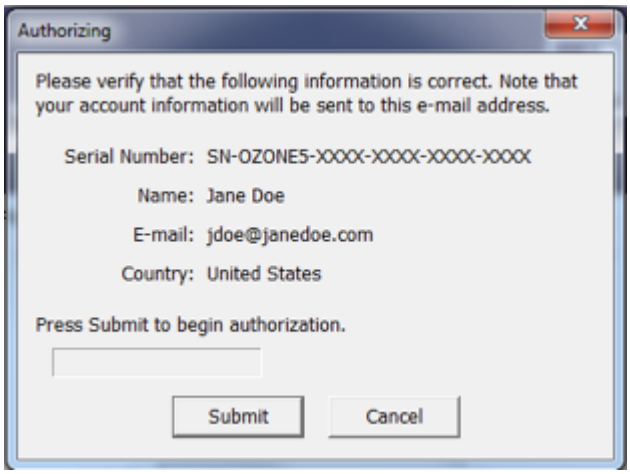
3. You must also enter your name and a valid e-mail address.

Note: Clicking the 'Advanced' button reveals a set of options that allow you to store your Ozone authorization on a portable hard drive or flash drive. Click here for more information on these options.

Make note of the e-mail address you use to authorize your license. Your license and iZotope account will be linked directly to this e-mail address.

4. When you have confirmed that your serial number and e-mail information is accurate, click once more on 'Authorize'.

5. Lastly, click on 'Submit' in order to send your authorization message to the iZotope servers.


Authorizing
Please verify that the following information is correct. Note that your account information will be sent to this e-mail address.
Serial Number: SN-OZONE5-XXXX-XXXX-XXXX-XXXX
Name: Jane Doe
E-mail: jdoe@janedoe.com
Country: United States
Press Submit to begin authorization.
Submit
Cancel

If the authorization is accepted, click on the 'Finish' button to complete the authorization.

iZotope Authorization
iZotope AUTHORIZATION
Authorization Successful
Ozone has been successfully authorized. If you have any questions about iZotope Authorization, please click the link at the bottom of this window.
Finish
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/authfaq.html

Authorizing Your Copy of Ozone 5 Offline

Some customers choose to keep their audio workstations offline, and a simple offline authorization option has been included. After opening Ozone 5 and launching the Authorization Wizard, the following steps will complete the authorization process offline:

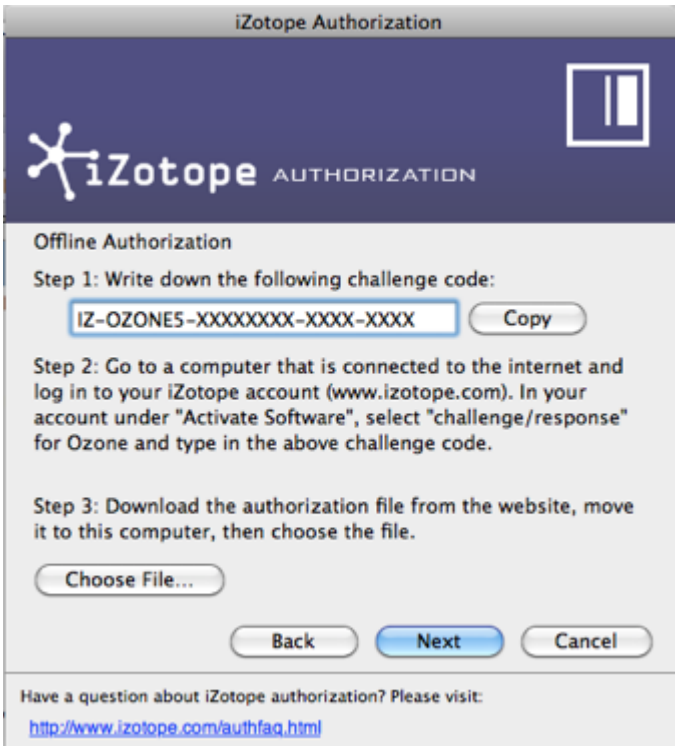
1. When first prompted to authorize Ozone 5, click on 'Authorize'

iZotope Authorization
iZotope AUTHORIZATION
iZotope Ozone 5 v5.00.554
Thank you for continuing your evaluation of iZotope Ozone 5. If you have already purchased Ozone, click Authorize to authorize the product. To continue using this demonstration version, click the Demo button.
For details on purchasing Ozone, please visit the iZotope website:
http://www.izotope.com/store/purchase.asp
Authorize
Demo
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/authfaq.html

2. Next, click on the option for 'Offline Authorization' at the bottom of the authorization window.

3. You will be given a unique Challenge Code that is specific to your computer only. Write down or make a copy of the exact Challenge Code. It will look like this:

IZ-OZONE5-XXXXXXXX-XXXX-XXXX

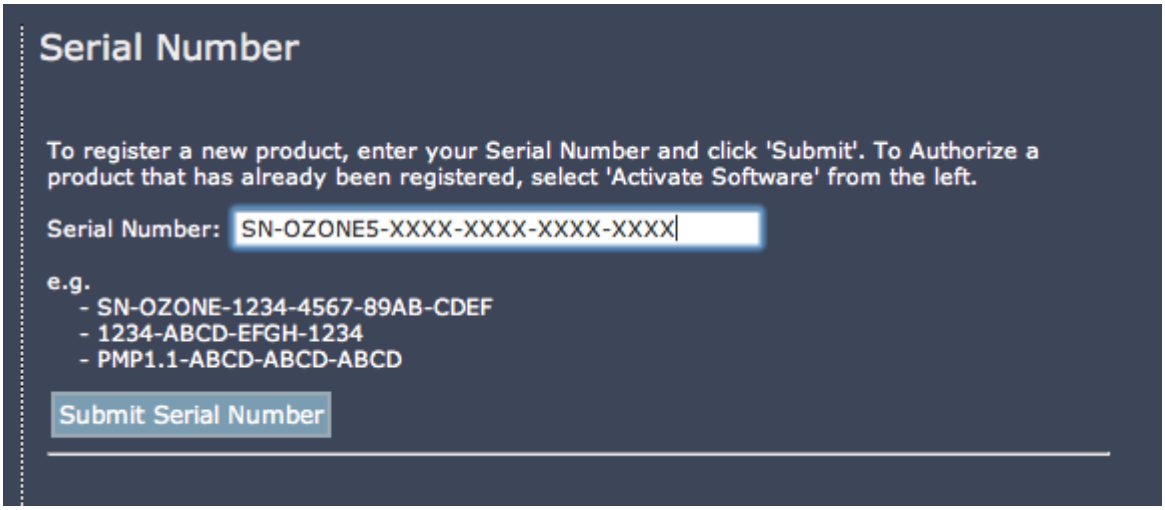

iZotope Authorization
iZotope AUTHORIZATION
Offline Authorization
Step 1: Write down the following challenge code:
IZ-OZONE5-XXXXXXXX-XXXX-XXXX
Copy
Step 2: Go to a computer that is connected to the internet and log in to your iZotope account (www.izotope.com). In your account under "Activate Software", select "challenge/response" for Ozone and type in the above challenge code.
Step 3: Download the authorization file from the website, move it to this computer, then choose the file.
Choose File...
Back
Next
Cancel
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/authfaq.html

4. Next, using a system with internet access, login to your customer account at the iZotope

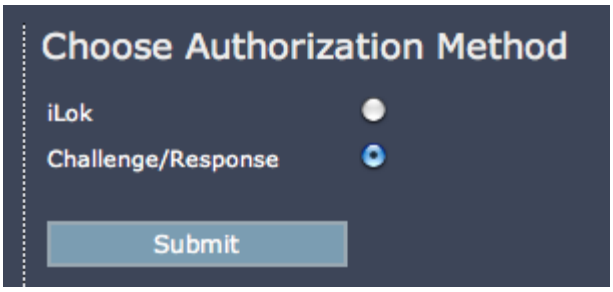
website.

http://www.izotope.com/store/account.asp

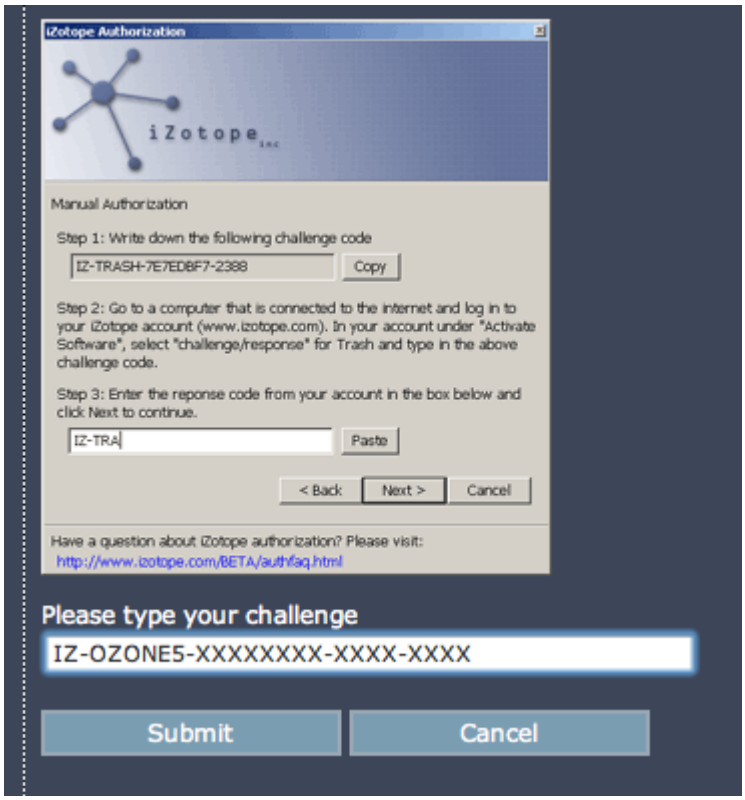
5. Click the 'Activate Software with a Serial Number' button, enter your full serial number and click 'Submit'.


Serial Number
To register a new product, enter your Serial Number and click 'Submit'. To Authorize a product that has already been registered, select 'Activate Software' from the left.
Serial Number:
SN-OZONE5-XXXX-XXXX-XXXX-XXXX
e.g.
- SN-OZONE-1234-4567-89AB-CDEF
- 1234-ABCD-EFGH-1234
- PMP1.1-ABCD-ABCD-ABCD
Submit Serial Number

6. Select the 'Challenge/Response' option and click on 'Submit'.



7. Now enter your full Challenge Code copied in step 3.


iZotope Authorization
iZotope
Manual Authorization
Step 1: Write down the following challenge code
IZ-TRASH-7E7ED8F7-2388
Copy
Step 2: Go to a computer that is connected to the internet and log in to your iZotope account (www.izotope.com). In your account under "Activate Software", select "challenge/response" for Trash and type in the above challenge code.
Step 3: Enter the reponse code from your account in the box below and click Next to continue.
IZ-TRA
Paste
< Back
Next >
Cancel
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/BETA/authfaq.html
Please type your challenge
IZ-OZONE5-XXXXXXXX-XXXX-XXXX
Submit
Cancel

8. After submitting your Challenge Code, you will receive a unique authorization file named 'Ozone_5.izotopelicense.xml' that you then need to move to your offline computer.

9. Once the authorization file is copied over to your offline computer using a network, hard drive or USB stick, click the 'Choose File...' button in your authorization wizard.

iZotope Authorization
iZotope AUTHORIZATION
Offline Authorization
Step 1: Write down the following challenge code:
IZ-OZONE5-XXXXXXXX-XXXX-XXXX
Copy
Step 2: Go to a computer that is connected to the internet and log in to your iZotope account (www.izotope.com). In your account under "Activate Software", select "challenge/response" for Ozone and type in the above challenge code.
Step 3: Download the authorization file from the website, move it to this computer, then choose the file.
Choose File...
Back
Next
Cancel
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/authfaq.html

10. Navigate and select the authorization file and click 'Next' to authorize your machine.

11. You should now receive a message that your authorization has been successful and may click Finish to begin using Ozone 5.

iZotope Authorization
iZotope AUTHORIZATION
Authorization Successful
Ozone has been successfully authorized. If you have any questions about iZotope Authorization, please click the link at the bottom of this window.
Finish
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/authfaq.html

iLok Support

Ozone 5 does support iLok. Our plug-ins will be able to detect iLok keys and assets if you already use iLok and PACE software on your system. If you don't already have PACE or iLok, we will not install any PACE or iLok software to your system, and iLok authorizations will be unavailable.

Authorizing Ozone with iLok

1. When first prompted to authorize Ozone 5, click on 'Authorize'

2. Next, enter the serial number in all capital letters as it it shown on your DVD sleeve or e-mailed to you.

SN-OZONE5-XXXX-XXXX-XXXX-XXXX

3. You must also enter your name and a valid e-mail address.

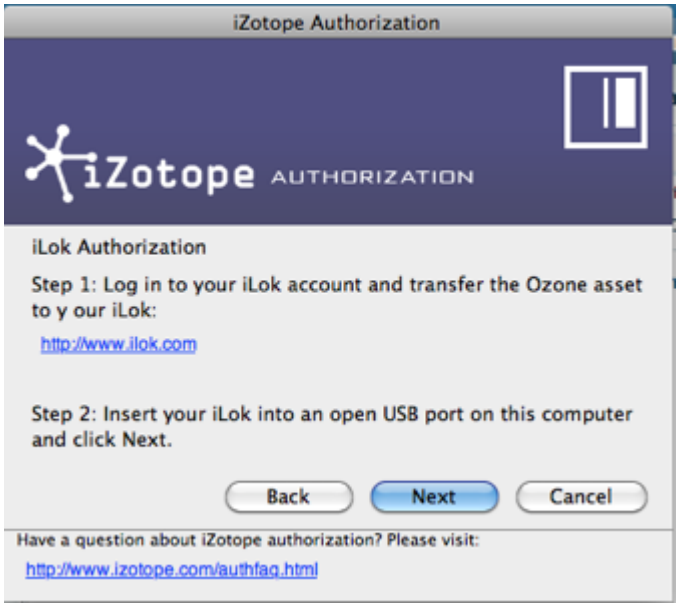
Make note of the e-mail address you use to authorize your license. Your license and iZotope account will be linked directly to this e-mail address.

4. Select 'Use iLok Authorization' and enter your iLok ID.

5. When you have confirmed that all your information is accurate, click once more on 'Authorize'.

6. Lastly, click on 'Submit' in order to send your authorization message to the iZotope servers.

7. You will now be instructed to log in to your iLok account and transfer your Ozone 5 license to your iLok.


iZotope Authorization
iZotope AUTHORIZATION
iLok Authorization
Step 1: Log in to your iLok account and transfer the Ozone asset to y our iLok:
http://www.ilok.com
Step 2: Insert your iLok into an open USB port on this computer and click Next.
Back
Next
Cancel
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/authfaq.html

8. When you have completed this step and have your iLok connected to the computer on which you want to use Ozone, click 'Next'.

9. You should now receive a message that your authorization has been successful and may click Finish to begin using Ozone 5.

iZotope Authorization
iZotope AUTHORIZATION
Authorization Successful
Ozone has been successfully authorized. If you have any questions about iZotope Authorization, please click the link at the bottom of this window.
Finish
Have a question about iZotope authorization? Please visit:
http://www.izotope.com/authfaq.html

Help

We have created an online article to help with common questions about our authorization system.

Removing Your Current Authorization

Use the authorization menu in Ozone's General Options panel to remove your current Ozone authorization, for example if you have upgraded to Ozone 5 Advanced and have already authorized Ozone 5 Basic. After removing your authorization, Ozone's authorization screen will pop up when you restart the program. Now you can re-authorize the application using a new serial number. You may also remove your Basic authorization at any time in order to run Ozone 5 Advanced in Trial or Demo mode.

Note: If you have downloaded Ozone 5 Basic and then purchased an upgrade to Ozone 5 Advanced, you will need to download Ozone 5 Advanced here and reinstall first.

What is Ozone?

A Complete Mastering System

Ozone is all you need to completely master your audio. Ozone 5 combines eight essential mastering processors into one complete system, letting you give your mixes a finished, full and professional sound.

Ozone's critically acclaimed IRC™ (Intelligent Release Control) Loudness Maximizer gives you commercial volume and fullness without distorting or coloring your mix. Two independent eight-band Paragraphic EQs combine linear phase precision with the warmth and character of analog equalizers and even let you intelligently match your mix to reference tracks. Innovative multiband Dynamics, Harmonic Exciter and Stereo Imaging tools add depth and polish to your projects and because these modules are integrated in a single powerful interface, Ozone maintains the highest quality processing throughout the entire signal chain while also making the mastering process more efficient and intuitive than ever before.

What's New?

Ozone 5 adds many quality and workflow improvements to every Ozone module, including new DSP algorithms and a wealth of visual tools to help you track and monitor changes made throughout the mastering process. Ozone Advanced includes additional processing tools in each module, a configurable Meter Bridge that can display relevant meter information in a separate, full screen window, and individual plug-ins for each of Ozone's modules.

When you see a

in the following documentation, this denotes a feature that is exclusive to Ozone 5 Advanced.

Key Features in Ozone

- Complete mastering system available in a single plug-in
- Includes eight essential mastering tools: Maximizer, two Paragraphic EQs, Dynamics, Stereo Imaging, Harmonic Exciter, Dithering, and Reverb
- Analog-modeled processing combined with linear phase precision
- Elegant, highly efficient user interface
- Extensive metering and visual analysis tools help you get better results
- Comprehensive preset system with over 100 professionally designed presets
- Module presets for mixing and matching settings between modules
- Integrated undo history with comparison tools
- User-definable signal routing
- Extensive automation support
- CPU-efficient and optimized for today's low-latency DAW environments

- Supports sampling rates up to 192kHz

Highest Audio Quality

Ozone uses highly optimized audio signal processing to achieve the highest resolution and sound quality possible. All of the mastering modules in Ozone are specifically designed to work together. By carefully matching crossovers and other internal processing, Ozone eliminates phase and artifact problems encountered when chaining together separate plug-ins. In addition, the sound quality and characteristics of each of the mastering modules is tuned to complement the others, providing consistent and high quality results.

Ozone uses analog modeling to give each of the mastering modules a smooth natural sound. For example, the equalizer recreates the soft limiting exhibited by a vintage valve equalizer, while the harmonic exciter mimics the musically pleasing harmonic saturation of a vacuum tube component.

Whenever there was a choice of CPU vs. sound quality, we chose sound quality. There are easier (less CPU intensive) ways of doing some of the processing that Ozone does, but the sound quality can suffer. Since Ozone is meant to be used for mastering, you would typically only have one instance of Ozone running on the main bus of a session, or in a 2 track editor, which should allow you to utilize Ozone even on lower powered CPUs.

Powerful Audio and Visual Feedback

We wanted to provide visual feedback wherever possible. Your ears and your eyes can be a powerful combination when you're mastering, and each processing module is complemented with useful spectrums, phase meters, and level histograms. Each module also has switchable views that highlight different aspects of how your mix is affected throughout mastering.

We also wanted to make it easy to get audio feedback by providing extensive solo/bypass controls and histories with functions for A/B comparisons. The Alt-click function on the EQ is an example of this as well. Wherever possible, we wanted to give you new ways to really hear what you are doing.

Intuitive Design and Easy to Use

We tried to make Ozone as easy and intuitive as possible from including a complete set of mastering modules in a single plug-in system, to context sensitive help, to the little things like mouse wheel support. There is a lot of power in Ozone, but we think that in no time at all you'll be making the most of it and getting great results with ease. Whether you're a seasoned professional or you're simply ready to take your productions to the next level, Ozone is the complete solution you need. Your mix isn't finished until you put it through Ozone.

This help file is a quick reference for basic Ozone functions and controls. We have written a separate Ozone Mastering Guide that provides tips and techniques for mastering with Ozone.

New Features in Ozone 5

If you're moving up from Ozone 4 to Ozone 5, we thank you for your continued support! Here are some changes and new features that you'll find in Ozone 5!

New Intelligent Workflow

Updated Interface

Ozone has been redesigned with a larger interface to make even more controls accessible on the front of the plug-in. Multibands are now color-coded with interface highlight colors that reflect the band you are currently viewing and/or adjusting a control for. The dynamics module now features a Show All Bands mode from which you can view and adjust all relevant settings for every dynamics stage of every band in one simple window. These updates allow for a more seamless workflow when performing multiband processing and streamline tasks that can be arduous in other plug-ins.

Module Presets

Ozone 5 has been updated with the added functionality to load and save presets for individual modules. You may apply settings to one module then mix and match presets from different modules to better address the needs of your mix.

New Intelligent Module Amount Controls

Ozone 5 now allows you to dynamically alter the settings of a module with configurable amount controls. This allows you to intelligently tweak the global settings of each individual module at any time from Ozone's main interface.

[ADV] Meter Bridge and Meter Taps

Ozone 5 Advanced's powerful new Meter Bridge provides a full suite of audio analysis tools, perfect for visualizing changes made during the mastering process, troubleshooting problematic mixes, and comparing your mixes to reference tracks. Included Meter Tap plug-ins allow you to route audio streams from anywhere in your mix and compare them with the output of Ozone.

[ADV] Component Plug-ins

Ozone 5 Advanced includes individual component plug-ins of each module in Ozone. Now you can selectively load individual modules into your session, each with their own dedicated module preset system.

New Processing Innovations

IRC™ Loudness Maximizer/ Intelligent III Mode

Ozone 5 includes a new processing mode in the Loudness Maximizer called "Intelligent III". This mode is optimized to preserve transients, so they sound sharper and clearer in the output signal, even when aggressive limiting is taking place. The new Intelligent III Loudness Maximizer mode listens to incoming audio to determine how much limiting can take place before any detectable distortion occurs. Try this on your mixes and hear the difference.

[ADV] Harmonic Exciter/ Triode Modes

We have updated the Harmonic Exciter to include new "Triode" modes. The Triode modes are modeled after tube circuits add the warm sound of a vintage preamplifier on up to four frequency bands, producing subtle dynamic and distortion effects.

Upward Dynamics processing and Soft Knee Compression

We have updated the Dynamics module to allow for ratios less than 1:1 at the gate, compressor, and limiter stage. This allows you to perform upward compression and upward expansion on your mix, giving you enhanced control of dynamic range. Additionally, we've added Soft Knee Compression to Ozone and Variable Knee Compression to Ozone 5 Advanced. Both allow you to perform more subtle and transparent compression on your mix.

Enhanced Hybrid Reverb module

New reverb processor utilizes both convolution technology to provide accurate early reflections of real acoustic spaces as well as algorithmic technology to give you greater control of your reverb's late tails. Together the two technologies give you enhanced control to fine tune the reverb to your mix. Add subtle "room tone" without an obvious reverb effect or thicken a mix with longer reverb decay times.

Getting Started

Using Mastering Presets in Ozone 5

Ozone's presets are designed to give you a quick starting point for mastering your own projects.

Every mix is different so no preset can perfectly master your project. However we have attempted to provide a wide range of presets that will help you find a good starting point for mastering your own material. By starting with a preset and using the Amount controls in Ozone's interface, you'll be able to tweak these presets to make them more closely fit the session you're working on.

We recommend you download the Ozone Mastering Guide to learn the basic principles of mastering with Ozone. Presets can take you a long way, but learning how each of Ozone's mastering modules works is key to getting the best results. You won't regret it–your masters will sound better than ever before!

Setting Your Input Level

Setting the input level in Ozone can make a huge difference in how the dynamics modules in Ozone behave. Setting your input level is important when selecting presets as the presets will sound drastically different if your input level is too loud or quiet.

As a starting point try setting Ozone's input level so that the input meter is peaking in the yellow area of the meter. It is OK if the input meter occasionally goes into the red when Ozone's Loudness Maximizer is enabled, it will keep the audio from clipping.

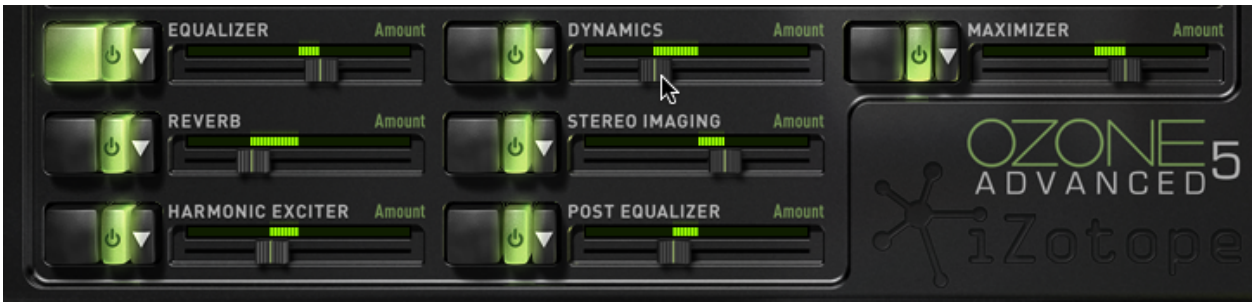
Choosing a Starting Point

Start by listening through several of Ozone's presets. You can start with a Genre-Based Mastering Preset or simply use the General Purpose Mastering presets. Because every mix is different, we've aimed to give you a lot of starting points so that you can choose the best one for your project. When you've found one that sounds like it has what your mix needs, you can start tweaking that preset to your liking.

Module Amount Controls

By starting with a preset you can subtly adjust the Amount Controls to help you get your mix closer to the way you want it to sound.

The Amount sliders are located at the bottom of Ozone's interface. You can adjust them to control how much each of Ozone's mastering modules affects your mix as well as how the module behaves. For example, turning down the Equalizer Amount slider can flatten out the EQ curve making the EQ's effect less dramatic. Increasing the Maximizer Amount control will boost the overall level of your mix. There is also a Global Amount slider below the input and output level controls that allows you to quickly adjust how much Ozone's modules process your mix overall.


EQUALIZER
Amount
DYNAMICS
Amount
MAXIMIZER
Amount
REVERB
Amount
STEREO IMAGING
Amount
HARMONIC EXCITER
Amount
POST EQUALIZER
Amount
OZONE 5
ADVANCED
iZotope

Mastering Modules
Standard Module Controls

At the bottom of each of the modules is a navigation bar that includes a set of buttons and controls. The function of these controls is the same regardless of which module you are using.

Reset Button: Resets the control to its default value . For most mastering modules, this means setting the values of controls in the displayed module to zero or some "neutral" state.

History: Clicking on the History button brings up a window which shows a history of the operations that have been performed. You can undo a single operation or sequence of operations and assign setups to keyboard shortcuts for A/B/C listening comparisons.

Module Preset: Load and save presets for individual modules to mix and match different module's settings to better address the specific needs of your mix. Launch each module's individual preset manager by clicking on the button to the right of the module's active LED.

Solo: Clicking the Solo button turns off (bypasses) all the mastering modules except the one currently displayed. This allows you to audition the effect of one module without hearing the effect of the others. If you change screens by selecting a different mastering module, the solo will be automatically turned off so that you can work immediately on the new screen and hear the effect (without worrying about whether a screen that isn't displayed is being solo'd).

Bypass: Clicking the Bypass button on the touchscreen turns off the processing within the currently displayed module. This allows you to compare the sound with or without the currently displayed module. Unlike the Solo button, if you change screens by selecting a different mastering module the bypass will still apply. This allows you to bypass more than one module.

Note: You can also bypass modules by clicking the Active light on the Ozone faceplate as shown below. You can solo a module by holding down the Alt key and clicking the Active light for the module you wish to solo.

Graph: The Graph button reveals the order in which Ozone processes audio through the main modules. Here is the default order of signal processing through the main mastering modules:

- Equalizer
- Reverb
- Dynamics
- Harmonic Exciter

- Stereo Imaging
- Maximizer

Clicking on the Graph button also allows you to change the order of processing, and insert the meters at any point in the signal path. You could, for example, view the spectrum before the EQ, or the phase meter after the reverb but before the stereo widening. By default, the spectrum and phase meter are based on the final output signal (the readout is the signal after all processing). The processing order of the final output stage is fixed by design. You can learn more about this in the Ozone Mastering Guide. The final output stage is as follows:

1. Output level gain control
2. DC offset filter
3. Dithering
4. Output level gain meter

Options: Opens the Options screen which lets you customize the behavior of meters and set other properties.

(?): Opens the Help file to the specific page or topic that relates to the mastering module shown.

Slider Compare Feature: You can Shift+Click on any slider in Ozone to quickly A/B the changes that have been made to that slider. This works for all sliders on the touchscreen as well as the Module/Global Amount Sliders.

Global Amount Control

You can use the Global amount control in Ozone 5 to make quick changes across all Ozone modules with a single slider. Beyond just A/B-ing your mix, this control lets you intelligently dial in "more" or "less" Ozone processing across your recording. You can easily hear the overall effect of a more aggressive or more subtle approach to your entire mastering session.

Use the Global Amount slider to hear the effect of adding or removing the amount of Ozone processing that is currently being applied to your session. This feature is most effectively used at the end of your mastering session or after a specific preset has been selected.

When the Global Amount slider is set to 100% you are hearing the default settings for the currently loaded preset. As you lower/raise the Global Amount slider, you will see all of the active modules lower/raise as well. The range of the amount control is from 0% to 200% as shown. You can also double click on the slider to enter a numeric value.

0% - no effect applied

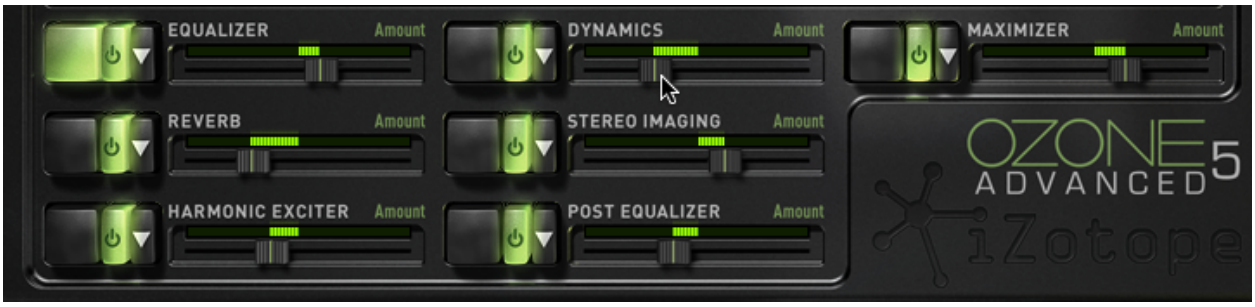
50% - (subtle) small amount of effect is applied

100% - (standard) full value of current settings are applied

200% - (aggressive) maximum value of current settings are applied

Module Amount Control

Each of the six Ozone modules have their own independent amount control sliders also. This lets you make the same quick changes to individual mastering modules without having to dig back into your session and refine individual parameters. This feature is controlled by the slider to the right of each module's selection/active LED and module preset button. The range of these sliders are from 0% to 200% where 100% is center (current settings-no additional processing applied), 0% is all the way to the left (bypass - no Ozone processing applied), and 200% is all the way to the right (maximum processing applied).



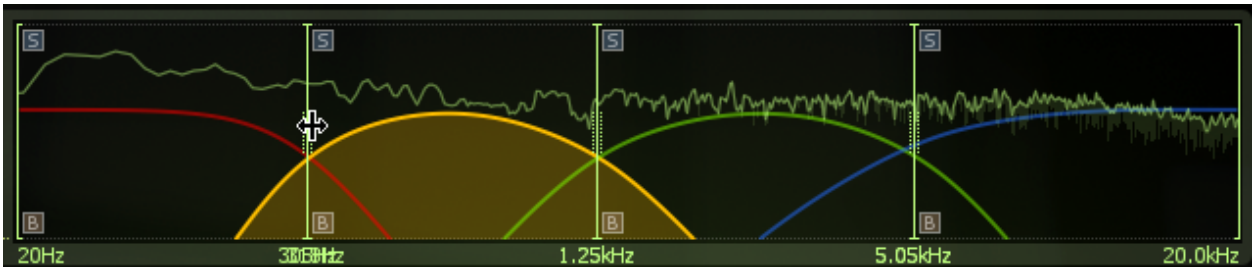
In each mastering module, the effect of the amount control slider is represented by a green line in the edit window. For example, in the EQ module it appears as a unique yellow EQ curve that flattens or boosts the overall EQ settings. In the Harmonic Exciter and Dynamics modules it can control the mix amount across all bands. In the Reverb module it can act as a Wet/Dry control.

Amount Controls can be configured in Ozone 5 to behave in various ways. For example, in the Dynamics module, the amount control could affect the Global Mix of the entire module or the threshold of the compressor. Custom configurations allow the module amount controls to best address the needs of your mix. To change the behavior of a module amount control slider, simply right click it and select the configuration option that best suits your mastering needs.

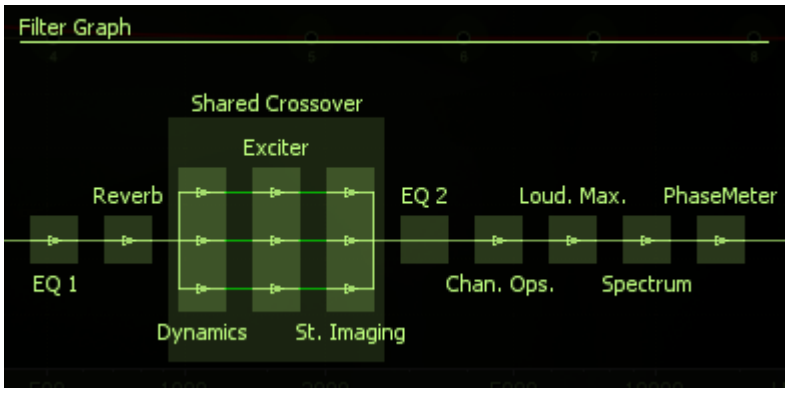
Note: If you Shift+Click an amount slider, it will jump to its last position for a quick A/B comparison of your settings.

Using Multiband Modules

The Dynamics, Harmonic Exciter, and Stereo Imaging modules in Ozone can be configured as multiband and therefore allow you to apply processing independently to up to four frequency ranges. The ranges (or cutoffs) of these four bands are shown at the top of the multiband modules with up to three vertical green lines. You can adjust the cutoffs by dragging the cutoff lines to the left or right with the mouse.



Note: The same four bands apply to all multiband modules within the Shared Crossover section in the filter graph. When sharing a crossover, the cutoff frequencies can be adjusted from any of the multiband module screens, and the new cutoffs will apply to the other multiband modules. This results in much better sound quality, as the multiband filters are always aligned and in phase.



Bypass a Band You can bypass the processing for a specific band (or bands) by clicking on the box labeled "b" in the lower left corner of the band. This allows you to hear the audio within that band, but without any processing for that band.

Solo a Band You can Solo a band by clicking on the box labeled "s" in the upper left corner of the band. This allows you to adjust multiband processing by hearing only the audio within the selected band.

Change the Number of Bands You can choose to split the audio into 1, 2, 3 or 4 bands. For subtle compression or when working with solo instruments, less bands can sound smoother as there is less processing required for the audio. The other benefit is that less CPU is required when working with fewer bands. To add or remove bands, right-click (under OS X you can also ctrl-click) on the mini-spectrum and select "Insert Band" or "Remove Band" as shown below:

Copy and Paste Settings Across Bands Using the same right-click menu, you can copy settings from one band and apply them (paste them) to another band. This is helpful, for example, for duplicating settings across bands in the multiband dynamics module.

Crossover Options

As multiband modules no longer have to share crossover settings, each module may have independent crossover options. Each multiband module's crossover options can be accessed from the "Crossover" section of the Exciter, Imager, and Dynamics tabs in the Options menu. You can right-click (under OS X you can also ctrl-click) the mini-spectrum and select "Options" to view these options as well.

Crossover Type: Options include Analog, Digital, and Hybrid.

Analog Crossover: The analog crossover option provides a natural character reminiscent of filter slopes in analog equipment.

Digital Crossover: Ozone 3 first introduced the option of digital linear phase crossovers. These provide a more accurate and transparent sound.

Hybrid Crossover: This perfect reconstruction IIR analog crossover is designed to reduce phase distortion and frequency distortion found in other analog crossovers while maintaining precise crossover points and the warm characteristics of analog crossovers.

Crossover Buffer Size: Sets the buffer size for the digital crossover. See Buffer Sizes for more info.

Crossover Q: You can adjust the bandwidth or Q of the crossover filters with this control. A higher Q results in tighter crossovers, while a lower Q provides a more gradual transition from one band to the next. This is only available for the digital crossover.

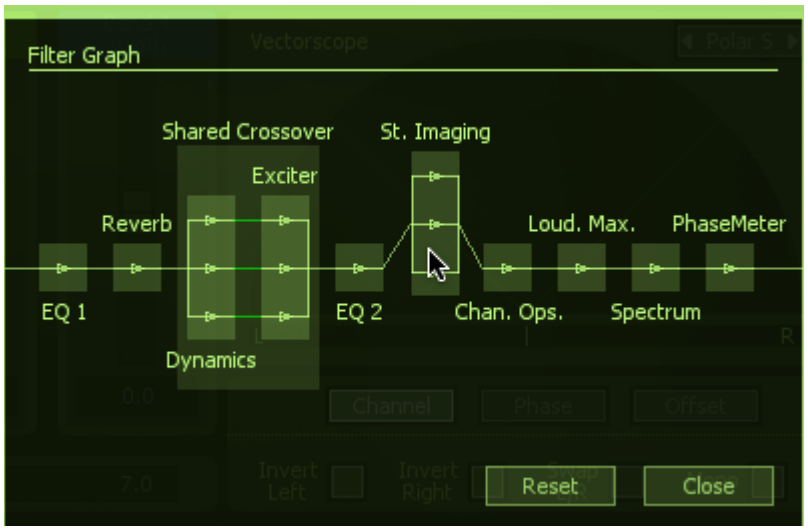
Automatic Crossover

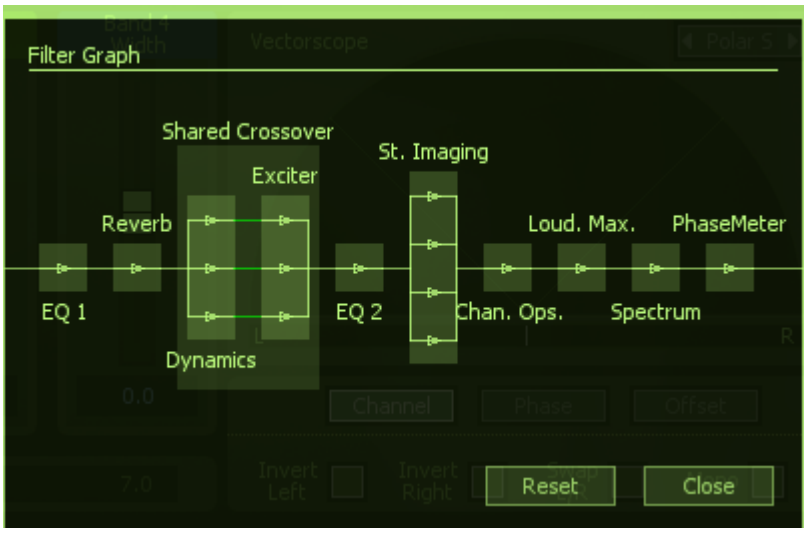
Ozone 5 includes an innovative "Learn" function which intelligently searches for a natural place to set your crossover cutoffs. To use this, right-click (under OS X you can also ctrl-click) in the crossover, select "Learn", then stream audio through the plug-in. Ozone will search for natural crossover cutoff points using a few criteria, including minima in the spectrum. Once Ozone has found a stable place for the cutoffs, the learn function will disable automatically.

You can also tell it to stop learning by right-clicking and choosing "Learn" again and you can double-click to enter a value for the cutoffs numerically.

Independent Crossover Settings

Ozone 5 allows for each multiband module to have independent crossover settings or share crossover settings with other modules. The three multiband modules, Dynamics, Exciter, and Imager, default to all sharing one crossover. This is represented in the Filter Graph by the Shared Crossover block. However, if a module is dragged outside of this block, their crossover settings may be set independently. Below you see that the Stereo Imaging module has been removed from the Shared Crossover and is using four-band processing while the shared crossover is using three bands.





Crossover Features

The following table outlines the different features of each crossover type. A crossover is a perfect reconstruction when the band signals sum up exactly to the original signal (not including band processing). Linear phase crossovers introduce no phase distortion when sub-band signals are individually processed and summed.

Crossover Type:	Analog	Digital	Hybrid
Perfect Reconstruction		√	√
Linear Phase		√	
Adjustable Q		√	
Low CPU Load	√		√
Low Latency	√		√

Global Crossover Options

Show Mini-spectrum Handles: Provides the option of turning on or off the horizontal handles (white lines) that appear on the multibands when adjusting controls. These handles allow you to make adjustments of certain parameters across multiple bands in the mini-spectrum window. This option appears under Crossover in the General Options tab.

When you select a control, horizontal lines appear on the multibands. These lines allow you

to adjust the control that you've selected for other bands, without having to switch to that band. So for example, in the screen above, the second band is the selected band, and the Limiter Threshold control is selected. You can adjust the Limiter Threshold value for the other bands by simply dragging the horizontal white line in the band you want to adjust.

Mid-Side Processing

Mid-Side processing adds a powerful dimension to Ozone's EQ, Dynamics, Harmonic Exciter and Reverb by letting you process the center and edges of the stereo soundstage separately.

What is Mid-Side Processing?

At the mastering stage, Mid-Side processing separates an ordinary stereo recording into its center and side elements (mid-side). This allows you to apply Ozone's processing to separate areas of your soundstage independently.

Now that your mix is divided into it's Mid and Side components, you can easily hear the separate elements that make up your soundstage. You can think of the "Mid" channel as the phantom image between your two speakers, or center channel of your audio. This is often composed of low frequency material and lead instruments (drums, bass, lead vocal, horns, etc). The "Side" channel will contain the remaining elements of your mix that exist at the edges of your soundstage (reverberation and/or instruments that are panned to one extreme side).

Standard Mid-Side Controls

Stereo/Mid-Side: This button allows you to switch between "stereo" processing or the new "mid-side" processing. When "stereo" is selected, the Ozone module will perform basic stereo signal processing. When "mid-side" is selected, all mid-side features become available.

Note: When the audio file is mono, the "stereo" button will be labeled "mono" and mid-side controls will be disabled.

Mid: When selected, processing is applied to the center of your soundstage. The more you boost the Mid channel, the more centered (mono) the audio will be.

Side: When selected, processing is applied to the edges of your soundstage. The more you boost the Side channel, the more spacious and full the audio will be.

Mid/Side Link: When selected, this allows you to make changes to both the Mid and Side channels at the same time. This tool helps improve workflow. By making changes to both channels simultaneously you don't need to switch back and forth between modes.

Note: Both Mid and Side channels can be bypassed and/or solo'd by selecting the little "b" or little "s" to the left and right of the mid-side icons.

Separate colors for Mid and Side channels

To make it easier to distinguish between "Mid" and "Side" modes, parts of the UI (interface highlights, sliders, EQ curves) will change color when each mode is selected. For example, in the Equalizer module the EQ curve for Mid will show up in the Mid color, and the EQ curve for Side will show up in the Side color. Mid is presented as orange, and Side is presented as dark blue.

Copy Settings to Mid and Side channels

Ozone's Mid-Side mode allows you to apply processing to Stereo, Mid, and Side channels independently. If you would like to copy your settings from one mode to another, simply right-click anywhere on the background to open a unique context menu with options for

copying your settings across modes. The available options are listed below.

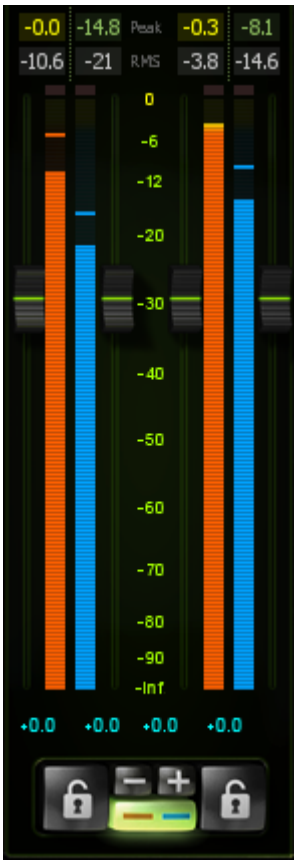
When Stereo mode is active: Copy to Mid Channel or Copy to Side Channel

When Mid mode is active: Copy to Stereo Channel or Copy to Side Channel

When Side mode is active: Copy to Mid Channel or Copy to Stereo Channel

Mid-Side metering

By default, the I/O meters will display the stereo mix of your audio. However, when working with Mid-Side processing, it is often very helpful to have a clear meter indication of the overall Mid and Side levels individually. To change your meters to display the Mid-Side information of your master, click on the Source button inside of the I/O Options menu.



When the I/O meters are in Mid-Side mode, they will no longer display your signal in terms of stereo left and right. Instead, on the left side of the meter will be the level of the entire Mid channel, and on the right will be the overall level of the Side channel. The left and right gain sliders will still control the left and right gain of your signal however. The Mid-Side meters will still adhere to the same Type and Scale settings defined in the I/O options menu.

Using Mid-Side Processing in Ozone

The following is a list of the Ozone modules that support Mid-Side processing. The links will take you to some examples of how to get started using Mid-Side processing in each module.

- Equalizer

- Reverb
- Harmonic Exciter
- Dynamics

Equalizer

Ozone's versatile EQ allows you to add warmth and character with analog matched filters, or precisely boost and cut frequencies with digital linear phase filters. In version 5, Ozone now offers two versatile EQs for placement within the signal chain. We've also added new filter shapes including Flat (Butterworth) low- and high-pass, Brickwall low- and high-pass, and vintage shelf filters.

Key Features

- Eight bands of bell, high-pass, low-pass, high-shelf or low-shelf filters
- Fully configurable spectrum analyzer with new views that highlight mid/side and stereo spectrums in useful ways
- Matching mode lets you use spectrum snapshots of recordings to create automatic EQ curves with an improved intuitive interface
- Powerful Mid-Side and Left-Right processing modes give you unprecedented control over the soundstage

Ozone Advanced Exclusives:

- Mixed Phase mode allows you to use both linear and analog-style phase filters in one equalizer
- Independent Curve Shapes for both analog-style and surgical curves in one equalizer

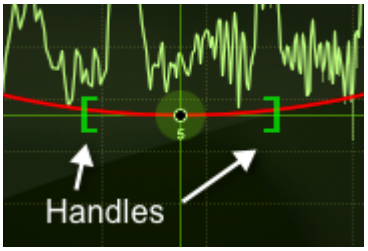
EQ Bands
Snapshots
Matching
EQ Mode
Analog
Digital
Matching
1 Low Shelf 30.0 Hz 0.0 dB 1.00 Q 0.00 P
2 Bell 100 Hz 0.0 dB 0.20 Q 0.00 P
3 Bell 300 Hz 0.0 dB 0.30 Q 0.00 P
4 Bell 700 Hz 0.0 dB 0.30 Q 0.00 P
5 Bell 1800 Hz 0.0 dB 0.30 Q 0.00 P
6 Bell 4000 Hz 0.0 dB 0.30 Q 0.00 P
7 Bell 8000 Hz 0.0 dB 0.30 Q 0.00 P
8 High Shelf 16000 Hz 0.0 dB 1.00 Q 0.00 P
Stereo
Mid
Side
Solo
Bypass
Options
History
Graph
Reset
?

Frequency and Gain

The green circles mark each of the eight EQ nodes. You can adjust an EQ band by clicking on a node and dragging the crosshairs to change the frequency and gain of the band. You can also use the arrow keys to adjust a selected band, or the Shift key in combination with the arrow keys to adjust in larger increments.

Q/Bandwidth

If you move the mouse over the "handles" on the side of the band, you can adjust the Q or bandwidth of the EQ by dragging with the mouse and widening the band. If you have a wheel mouse, you can use the mouse wheel to widen/narrow a selected band.



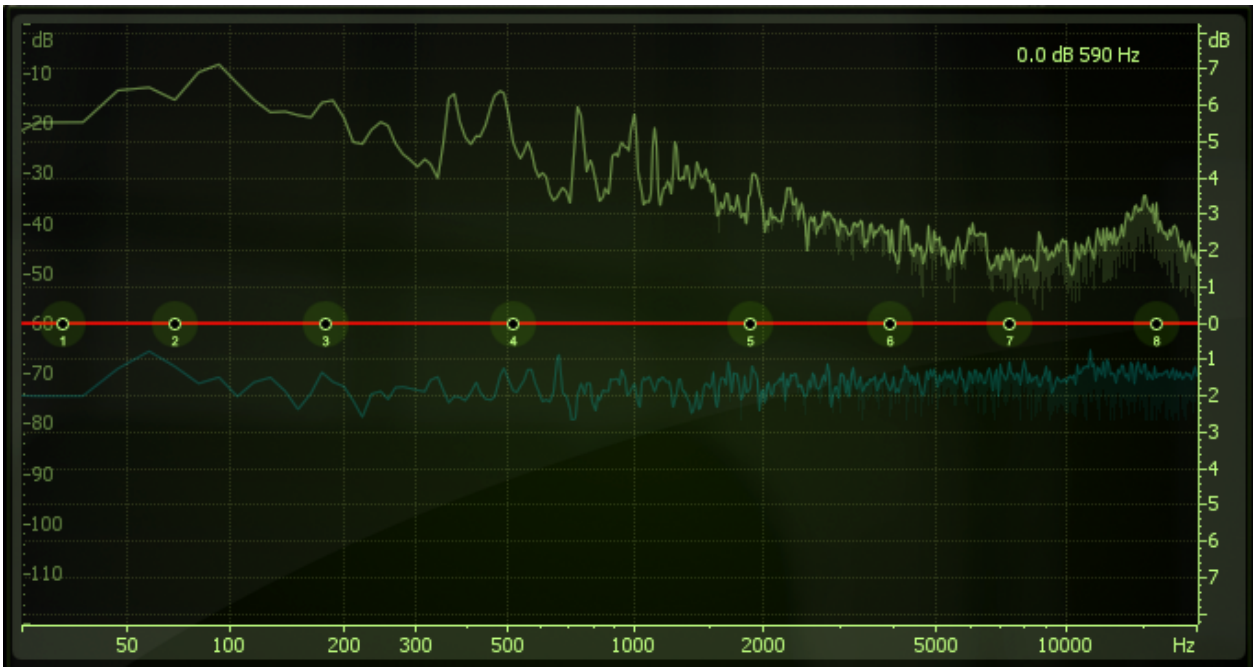
Visuals

As you adjust a band you will see two EQ curves. The bright red curve is the composite of all EQ bands while the darker red curve shows the EQ curve of the selected band.

Spectrum Overlay

A spectrum by default is overlaid on the EQ module for visual feedback of the mix. You can turn off the spectrum to conserve CPU or if you just don't want to see it using the Options screen. You can also set options such as average or real time spectrum, show peak spectrum, Mid/Sid difference spectrum, etc. These are available in the Spectrum Options screen.

In the background you'll see the gain scale for the EQ on the right in green. This will change as you zoom the EQ in or out. You'll see the scale for the spectrum along the left in green.



Note: The scales for the EQ and spectrum are different, by design. If they were made to match, you wouldn't see enough of the spectrum for it to be useful. The frequency scale in grey applies to both the EQ and the spectrum.

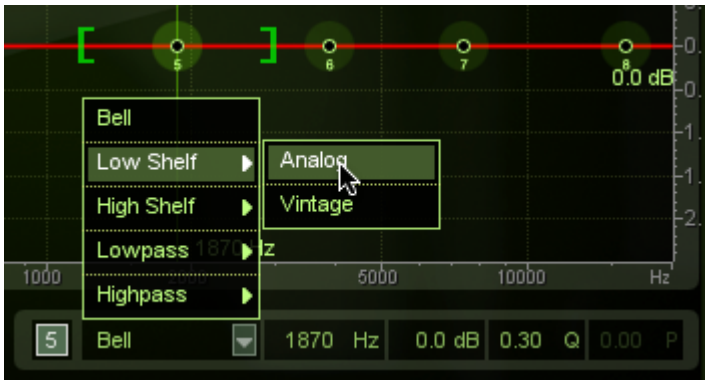
Selecting Filter Shapes

Ozone provides the ability to set the type or shape of any of the eight EQ nodes. Any node can be a lowshelf, lowpass, bell, highshelf or highpass filter. When in analog mode, or in Ozone 5 Advanced in non-surgical digital mode, a number of new filters are available:

Flat Lowpass/Highpass – These are Butterworth filters; optimized for maximum flatness without ripple or resonance in the passband or stopband.

Brickwall Lowpass/Highpass – These are elliptic filters; optimized for steepness with minimal ripple in the passband and stopband.

Vintage Lowshelf/Highshelf – These high and low shelf filters exhibit a complimentary frequency dip modeled after the renowned Pultec analog equalizer creating a complex slope with one node.



To change the shape select a node and click on the drop down menu in the bottom right or

simply right-click the node. To worked in the expanded info view, click on the "+" button.

From this table, you can specify a different filter shape for each node. If you had selected a node in the main screen before opening the expanded screen, that node is shown as selected in the table (i.e. Node 5 has brackets around it, indicating that this was the EQ node that is currently selected).

Note that you can also use the dialog boxes to enter values for the EQ bands directly. You can also disable bands with this table by clicking on the square number box to the left of a band in the table.

0.0 dB 1756 Hz
Bell
Low Shelf
High Shelf
Lowpass
Highpass
EQ Bands
Snapshots
Matching
Analog
Digital
Matching
1 Low Shelf 30.0 Hz 0.0 dB 1.00 Q
2 Bell 100 Hz 0.0 dB 0.20 Q
3 Bell 300 Hz 0.0 dB 0.30 Q
4 Bell 700 Hz 0.0 dB 0.30 Q
5 Bell 1800 Hz 0.0 dB 0.30 Q
6 Bell 4000 Hz 0.0 dB 0.30 Q
7 Bell 8000 Hz 0.0 dB 0.30 Q
8 High Shelf 16000 Hz 0.0 dB 1.00 Q

Selecting Analog or Digital Curve Shapes

Ozone offers a choice of analog curve shapes, modeled after classic equalizers using IIR filters, or more precise "surgical" shapes reminiscent of digital equalizers using FIR filters. The choice is a matter of subjective taste, although as a guideline the analog shapes provide a classic sound for general mastering, while the digital filters provide more precise control.

Matching EQ

A third EQ mode is the matching mode. This allows you to automatically equalize a mix

based on the spectrum or frequency response of another recording. The matching EQ is a digital linear phase EQ, with the ability to use over 8,000 bands of frequencies for very precise matching. For step by step instructions on using the Matching EQ, see here...

As would be expected, the Matching EQ works hand in hand with spectrum snapshots to "borrow" the spectrum of one audio clip and apply it to another.

Post Equalizer

Ozone now includes a second Equalizer for placement anywhere in your signal chain. Balance frequencies after multiband processing or perform Stereo and Mid/Side or Left/Right EQ processing simultaneously all from within Ozone.

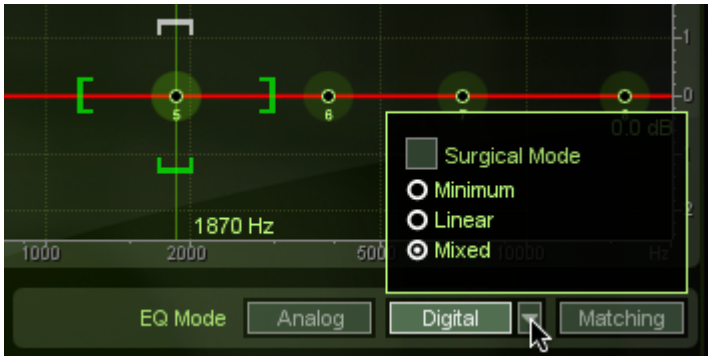
[ADV] Selecting Phase

Ozone now offers filter phase control when in digital mode with three selectable phase modes:

Minimum phase filters that have a transient response similar to analog EQs in that most of the ringing is concentrated after the transient.

Linear phase filters that maintain symmetric response, meaning equal pre- and post-ringing, as is often characteristic of digital EQs.

Mixed phase mode allows each individual band to have a phase response varying between minimum phase (-1), linear phase (0), and maximum phase (+1). Maximum phase filters concentrate all ringing before the transient where it is most audible.



In mixed phase mode the phase response of a given node can be adjusted with vertical handles that appear on a selected node when Mixed phase mode is selected. These behave much like the horizontal handles which affect Q/bandwidth. Alternatively, phase response values may be entered manually in the Show Info table. Different phase responses will often produce quite subtle sonic differences unless you are doing very steep filtering.

[ADV] Surgical Mode

Ozone now allows you to turn off surgical mode and recreate analog shapes with digital phase response. Surgical mode must be off to use new filters like Vintage High/Low Shelf in digital mode. When surgical mode is off however, you will not be able to make as precise and targeted cuts and boosts.

Mid-Side and Left/Right Support

Stereo/Left-Right/Mid-side: This button allows you to switch between "stereo" processing, the new "Left/Right" processing, and "Mid/Side" processing. When "Stereo" is selected, the Ozone module will perform basic stereo signal processing. When "Mid/Side" is selected, the center and spatial information may be processed independently. When "L/R" is selected, the left and right channels may be processed independently.

Colors

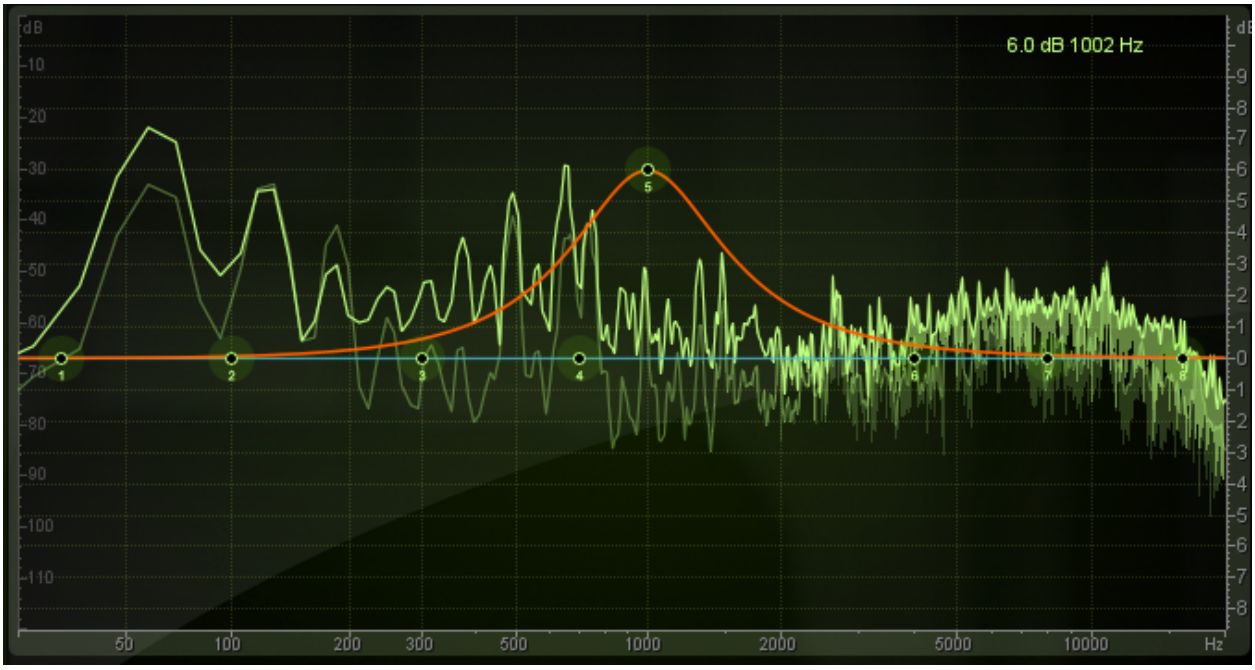
To make it easier to distinguish between Mid and Side modes, the EQ curve for Mid will show up in the mid color, and the EQ curve for Side will show up in the side color. Mid is presented as orange, and Side is presented as dark blue. If the Mid channel is selected, we'll show the Side EQ curve faintly in the background, and vice-versa.

To distinguish between Left and Right modes, the EQ curve for Left channel will show up in the left color, and the EQ curve for Right channel will show up in the right color. Left is presented as light green, and Right is presented as turquoise. If the Left channel is selected, we'll show the Right channel EQ curve faintly in the background, and vice-versa.

These colors are also featured in the table of EQ nodes and their settings.

Note: In all cases of Mid-Side and Left-Right processing, you have the same filter controls available as the rest of the EQ module.

To learn about the new Mid-Side Processing controls, see here...



Example using "Mid" Processing in Ozone EQ

Select Mid-Side mode in the EQ module and Click "Mid" to reveal an orange EQ curve. Then click the small "s" to solo the Mid channel. When you play an audio file in this mode, you will only hear the content assigned to the center of your soundstage, which is typically your lead

vocal (other lead instruments, etc). Now select an EQ node around 1kHz and boost the orange EQ curve about 6dB. This frequency specific boost at 1kHz will only be applied to the center of your soundstage and can bring up the lead vocal in the mix without affecting the other instruments or the stereo separation of the entire frequency range.

Example using "Side" Processing in Ozone EQ

Select Mid-Side mode in the EQ module and Click "Side" to reveal a blue EQ curve. Click the small "s" to solo the Side channel. When you play an audio file in this mode, you will only hear the content at the edges of your soundstage which is typically reverb tails or instruments that are panned to an extreme side. Now select an EQ node around 6kHz and boost the blue EQ curve about 6dB. This frequency specific boost at 6kHz will only be applied to the edges of your soundstage. The effect when applied will result in greater stereo widening and a richer fuller sound.

Example using "Left/Right" Processing in Ozone EQ

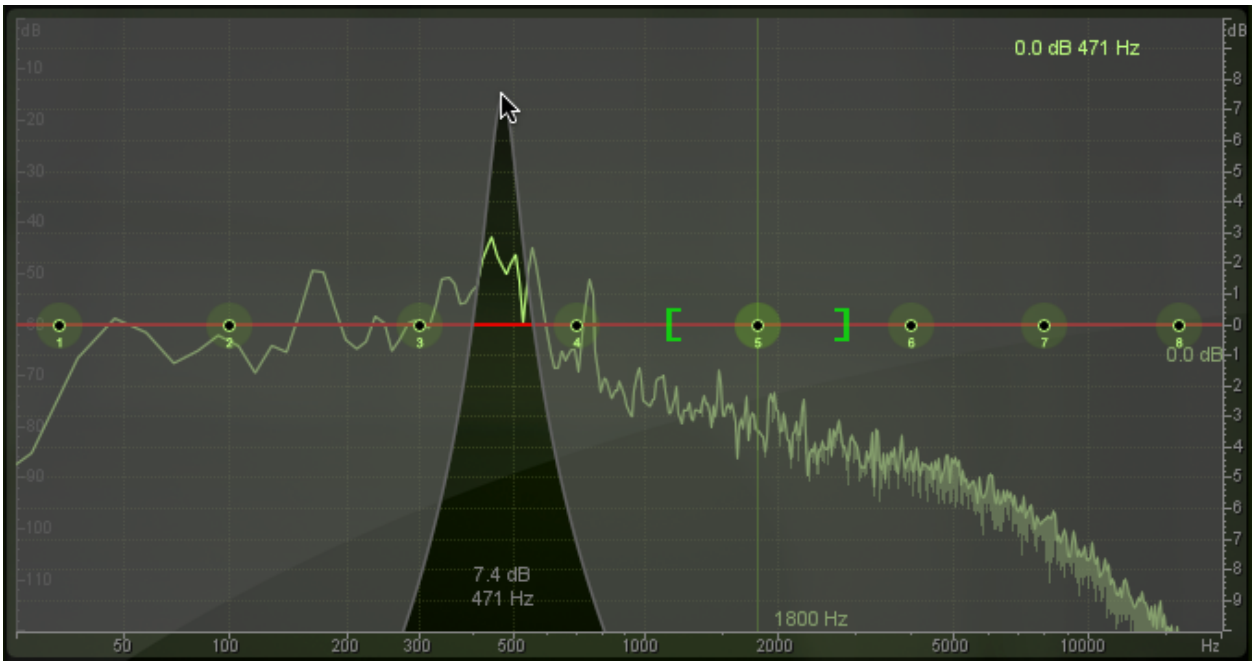
Select Left/Right mode in the EQ module and Click "Right" to reveal a turquoise EQ curve. Click the small "s" to solo the Right channel. When you play an audio file in this mode, you will only hear the content on the right side of your soundstage. Now select an EQ node around 8kHz and cut the turquoise EQ curve about 1dB with a Q value of around 6. This frequency specific cut at 8kHz will only be applied to the right side of your soundstage. For example, this can be useful if the sound of a high-hat is too bright only in the right channel of the stereo signal. Independent equalization in the left and right channels should be very subtle though in order not to offset the stereo image.

Amount Control

The amount control for the EQ module is a quick and easy way to increase or decrease the amount of equalization added or effect the bandwidth of a filter. This is not a simple wet/dry control, as the amount control intelligently changes the EQ's internal parameters when the level is increased or decreased. The resulting effect of the amount slider is displayed by a yellow curve in the main edit window.

The Alt-Solo Feature

If you hold down the Alt key and click on the spectrum, you have an "audio magnifying glass" that lets you hear only the frequencies that are under the mouse cursor, without affecting your actual EQ settings. This is useful for pinpointing the location of a frequency in the mix without changing your actual EQ bands. Releasing the mouse button returns the sound to the actual EQ. You can set the default bandwidth of this filter in the Options screen under "Alt-Solo Filter Q" or simply use your mouse's scroll wheel. Once you've pinpointed a particular frequency using the Alt-Solo feature, double-click that area to activate a new node in that exact location.



Additional Mastering Tips using Ozone's Paragraphic EQ

1. The Paragraphic EQs scales are now freely zoomable and scrollable, allowing you to focus on a specific frequency and dynamic range. While hovering over the dB meter on the right of the spectrum, you may use your mouse wheel to zoom in on a more focused dynamic range, then click and drag to scroll the dB scales. Additionally, while hovering over the frequency scales at the bottom of the spectrum, you may use your mouse wheel to zoom in on a particular frequency then click and drag to scroll the scales.

2. If you hold down the Shift key and drag an EQ band, the EQ band will be "locked" in the direction that you're dragging. So if you just want to change the gain without affecting the frequency (or vice-versa) just hold the Shift Key while you drag.

3. If you hold down the Ctrl key under Windows or the Command key under OS X, you can click and select multiple bands. Once selected, you can adjust them as a group by clicking and dragging on the first band you selected in the group.

4. If you'd rather use numbers as opposed to visual EQ bands, clicking on the "**+**" button gives you a table view of the EQ band settings. You can enter values for the EQ bands directly in this table. You can also disable bands with this table by clicking on the square box to the left of a band.

5. If you've chosen to display an averaging spectrum or a peak hold spectrum (using the Spectrum Options screen) you can reset the peak hold or the averaging by clicking on the spectrum.

6. Right click on the spectrum to bring up an options dialog to control the spectrum display.

[ADV] Component Equalizer Plug-in

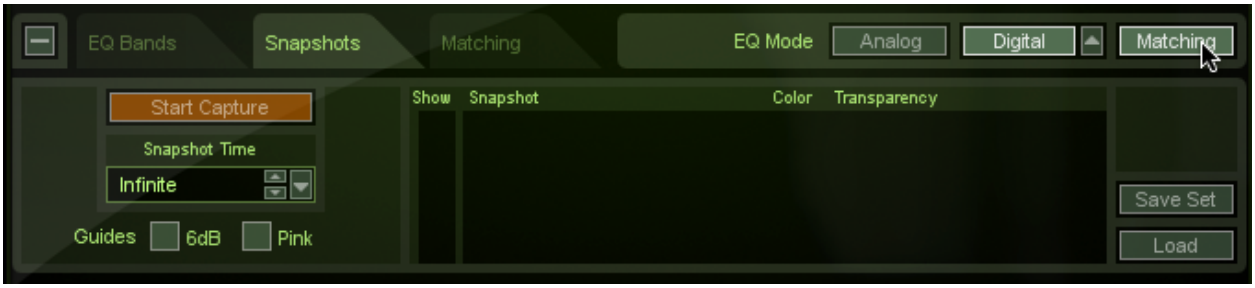
If you are using Ozone 5 Advanced you will also have the ability to instantiate Ozone 5's Equalizer module as an individual component plug-in. Ozone 5 Advanced includes component plug-ins for all six of Ozone's modules complete with all the same features as the module within Ozone. Any module presets saved within Ozone will open within the component plug-ins' module preset system.

Matching EQ

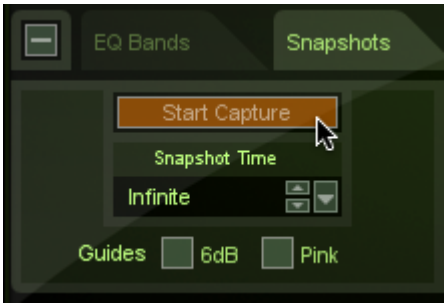
The matching EQ allows you to automatically equalize a mix based on the spectrum or frequency response of another recording. The matching EQ is a digital linear phase EQ, with the ability to use over 8,000 bands of frequencies for very precise matching. The following steps explain how to use the Matching EQ.

Capturing your Reference and Apply To spectrums and applying matching EQ

The Matching EQ works hand in hand with spectrum snapshots to "borrow" the spectrum of an audio clip and apply it to another. Therefore, the first step is to take snapshots of two spectrums - the mix you want to EQ and the recording that has the spectrum you want to match.



1. Select the Snaphots tab in the lower-left of the spectrum window and select Matching under EQ Mode.
2. Load the recording that you want to use for your EQ curve in your host audio application.
3. Now, while the recording is playing back, hit the Start Capture button to begin capturing the spectrum and Stop Capture when you have captured the portion of the recording you wish to apply to another mix. This snapshot will now be added to the list on the right where it may be renamed and have its color and opacity in the spectrum display adjusted.



Snapshot Time: This new setting allows you to determine how the spectrum is averaged. Instead of displaying only the infinite average of the spectrum, it will also calculate and display an overall average spectrum for your mix using either real-time or a 1, 3, 5, or 10 second average. While this isn't technically necessary for using the Matching EQ, you most likely want to match the overall spectrum of a mix, as opposed to an instantaneous spectrum.

4. Now repeat the previous steps with the new mix that you would like to match

with the recording you captured previously. You will now have two snapshots listed in the snapshots menu.

5. Now click on the Matching tab and select "Reference" next to the first snapshot of the recording with the desired spectrum or frequency response and select "Apply To" next to the snapshot of the second mix that you want to be affected by the matching EQ process.

6. Click Match and a new red filter curve will appear which will conform the spectrum of the second mix to the spectrum of the first mix.

7. Use the Amount and Smoothing tools to adjust how aggressively your mix will be matched to the originally captured recording as well as the sharpness of the EQ curves' peaks and valleys.

Matching Tips

- As you increase the Matching amount, you'll notice a red EQ curve appearing. Most likely, the more you increase the Matching amount the more "jagged" this Matching EQ curve will become, with increasing peaks and valleys.
- A Matching amount of 100% and a Smoothing amount of 0 might be technically the closest match to your "Apply to" mix, but in reality it's probably not the most effective combination of settings. Those settings will try to capture every peak, valley and level, which can result in extreme (unnatural) EQs.
- We suggest working with the Matching amount around 50%. If your Matching EQ curve has narrow peaks and valleys, increase the Smoothing parameter to smooth them out. Your goal is to capture the overall tonal shape of the Reference as opposed to an exact match.
- Adjust manually as necessary. Close the Snapshots window, and you'll notice that you can still use the manual EQ nodes to further adjust the equalization. It may not be necessary, but feel free to further "season to taste" manually.

- Matching settings are universal for both of Ozone 5's Equalizers so you may only perform matching with one EQ in the signal chain. However, each instance of Ozone 5 or Ozone 5 Advanced's Component EQ may load and save its own snapshot sets.

Mastering Reverb

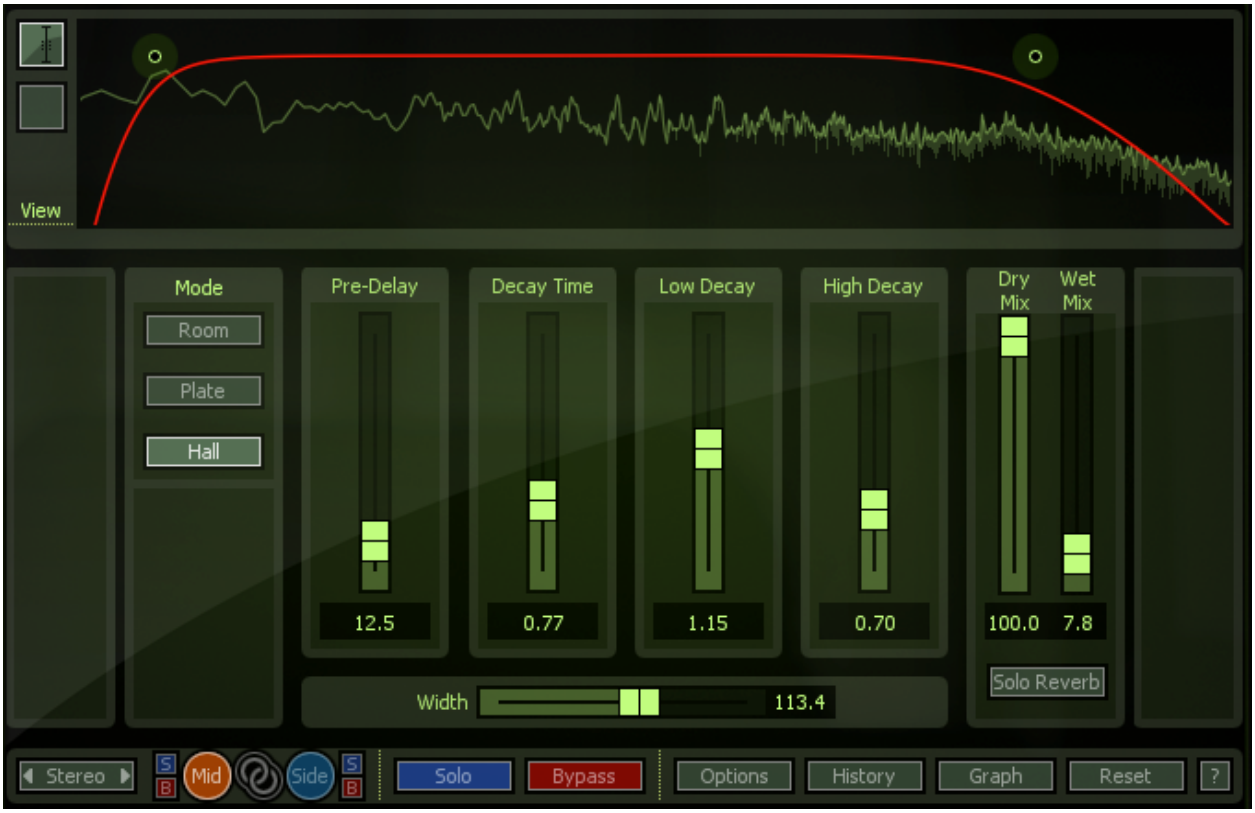
Ozone includes a high quality hybrid reverb module that can add a consistent sense of depth and space to a mix. Utilizing both convolution and algorithmic technologies, the improved reverb module features the warm early reflections of a real acoustic space as well as dense and flexible reverb tails. It is designed to put a final gloss or sheen on the entire mix while still preserving the sense of space that may have been created by using reverbs on individual tracks.

Key Features

- Hybrid reverb processing utilizing both convolution and algorithmic technology
- Choose between various room modes
- Plate mode derived from the classic EMT 140
- Mid/side controls allow you to apply ambience to different parts of the soundstage

Ozone Advanced Exclusives:

- Crossmix control allows you to adjust the amount of stereo spread between the left and right channel's reverb signals
- Early reflection control to better fine tune reverb



Note: When using the Reverb module, Ozone will consume a significantly higher amount of CPU, especially during parameter changes. To help make Ozone more usable in real time, you can offload some of these changes to prevent the audio from dropping out. See the Reverb Options Tab for more info.

Early Reflections

Ozone 5 features a number of room modes that control the reverb's early reflections. Convolution technology is used to reproduce the acoustics of real spaces.

Early Reflection Modes:

Room – smaller acoustic space with strong and distinct early reflections

Plate – classic reverb effect which captures the vibration of a sheet metal plate when audio is played onto it creating a clean distinctive reverb tone. Ozone 5's plate reverb mode was derived from the characteristics of the definitive plate reverb unit, the EMT 140.

Hall – large acoustic space with darker warm reflections

Theater –medium sized acoustic space with dampened early reflections (Ozone 5 Advanced)

Cathedral – larger acoustic space with pronounced bright reflections (Ozone 5 Advanced)

Arena –massive deep acoustic space with expansive density (Ozone 5 Advanced)

Early Reflection Options:

Once an early reflection mode is selected you may adjust the following options that affect it:

Pre-delay: Sets the "pre-delay time", or the amount of delay in milliseconds between the original signal and the beginning of the reverb in order to simulate depth.

[ADV] **Early Reflection Control:** Lowers the level of early reflections in the reverb signal and can be used with pre-delay to create the perception of depth. (Ozone 5 Advanced)

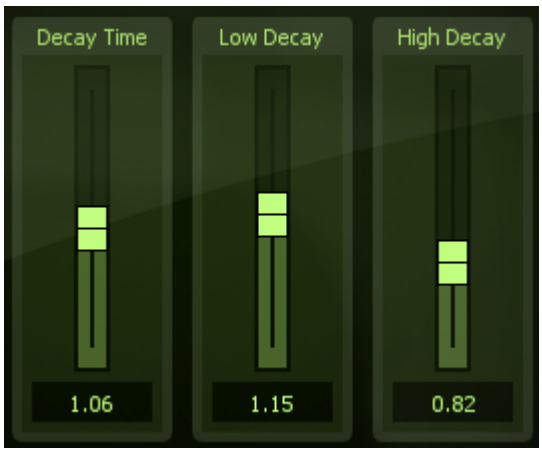
Late Tails

After the initial early reflection, Ozone 5 uses algorithmic technology to simulate late reverb tails. This allows you to couple the early reflections of one type of space with late reflections associated with another to create unique but realistic sounding reverb. Once you have chosen an appropriate early reflection, you may adjust the following characteristics of the late tails:

Decay Time: sets the amount of time it takes for the reverb to fully decay

Low Decay: adjusts how quickly the low frequencies decay

High Decay: adjusts how quickly the high frequencies decay



Global Reverb Settings

After the early and late reflections have been defined, the following settings affect the entire reverb signal:

Wet and Dry: These control the mix between the processed reverb signal (Wet) and original unprocessed signal (Dry).

Width: Controls the stereo spread of the reverb signal.

Solo Reverb Signal: This check box lets you solo just the reverb signal.

Low and High Frequency Cutoff filters
You can control the bandwidth of the reverberated signal using the low and high frequency cutoffs. On the spectrum at the top of the module there are two nodes that create a curve that corresponds to these cutoffs. You can drag the nodes to the left or right to control the bandwidth of the reverb.

Mini-Spectrum Window

The window at the top of the module defaults to a display of the signal spectrum which also features the Low and High frequency Cutoff filters. However, with a selection on the left it may also display the Reverb Character view.

Reverb Character view displays a graph that illustrates the character of the reverb signal over time given the settings you have selected. This display can help you visualize how different settings affect the overall character of the reverb signal.

[ADV] **Crossmix:** Adjusts the amount of stereo spread between the left and right channels' reverb signals.

Mid-Side Support

Stereo/Mid-side: This button allows you to switch between "stereo" processing or "mid-side" processing. When "stereo" is selected, the Ozone module will perform basic stereo signal processing. When "mid-side" is selected, all mid-side features become available.

Colors

To make it easier to distinguish between Mid and Side modes, the interface highlights and Reverb Character view have designated colors. Mid mode is presented as orange, and Side mode is presented as light blue.

Example using Mid-Side Processing with Mastering Reverb

Mid-Side processing allows you to separate a specific frequency range into its Mid and Side components and apply processing separately to the Mid (center) channel, or the Sides of your mix. When using the Mastering Reverb this allows you to tailor the reverb to more accurately depict your desired soundstage. For example, you can add both space and ambience to your mix by applying the reverb only to the sides of your soundstage.

To do this, begin by enabling the Side channel (light blue). Select the frequency bands for the instrument(s) that you want to apply the reverb to. Finally adjust your wet/dry mix to taste. Using Bypass in the Reverb module, try switching back and forth to hear the difference in your mix.

In other cases, you may actually use this feature to reduce the amount of reverb in the Mid channel to make the lead components sound more clear.

To learn more about the new Mid-Side Processing controls, click here...

[ADV] Component Reverb Plug-in

If you are using Ozone 5 Advanced you will also have the ability to instantiate Ozone 5's

Reverb module as an individual component plug-in. Ozone 5 Advanced includes component plug-ins for all six of Ozone's modules complete with all the same features as the module within Ozone. Any module presets saved within Ozone will open within the component plug-ins' module preset system.

Harmonic Exciter

Harmonic exciters can give a sparkle or shine to the upper frequencies of a mix. They can also be used in mid and even low frequencies to add a boost or presence. Add warmth, sparkle and shine with four separate bands of excitation. Like other multiband modules in Ozone, the multiband harmonic excitation is based by default on the four bands set in the multiband section.

Key Features

- Choose from tube or tape-modeled saturation with adjustable mix controls for each band
- Unique multiband time offset controls for tightening and adding attack to bass and kick
- Mid/side processing lets you add color to different parts of the soundstage separately
- New Saturation meter highlights affected frequencies and a post filter to sculpt the frequency output of the exciter

Ozone Advanced Exclusives:

- New Triode modes simulate the analog warmth of vintage preamplifiers

Note: Each band has its own sliders to control the amount of harmonic excitation and the mix of the excited signal with the original signal.

Exciter Modes:

Retro: Retro mode is based on characteristics of transistors with a slowly decaying row of odd harmonics.

Tape: Tape modeling can be recognized as a brighter sound due to the odd harmonics found in tape saturation models.

Tube: Tube modeling is characterized by its clear "tonal" excitation with an emphasis on dynamic or transient attacks.

Warm: The Warm exciter mode is similar to Tube, but is unique because it generates only even harmonics that decay quickly.

[ADV] **Triode**: Triode mode is accurately modeled after a tube circuit for realistic analog warmth. Triode mode uses one half of a tube circuit for a subtler overdrive than Dual Triode mode.

[ADV] **Dual Triode**: Like Triode mode, the Dual Triode mode models a full circuit using a vacuum tube introducing more pronounced overdrive with a slightly warmer tone.

Exciter Controls

Amount: Controls the amount of the harmonic excitation for the selected band.

Mix: Allows you to control the mix of the excited signal with the original mix.

Delay: Setting the delay for a band offsets this band relative to the other frequencies. To learn how and why this works as an exciter, refer to our online mastering guide.

In general, try offsetting the delay for a low band (<150 Hz or so) by about 1 msec. The low band will get tighter, but probably lower in perceived volume. Because it is tighter in time, though, you can usually compress or increase the gain of that band in the multiband dynamics module to get "punch" without a ringing or "flabby" sound.

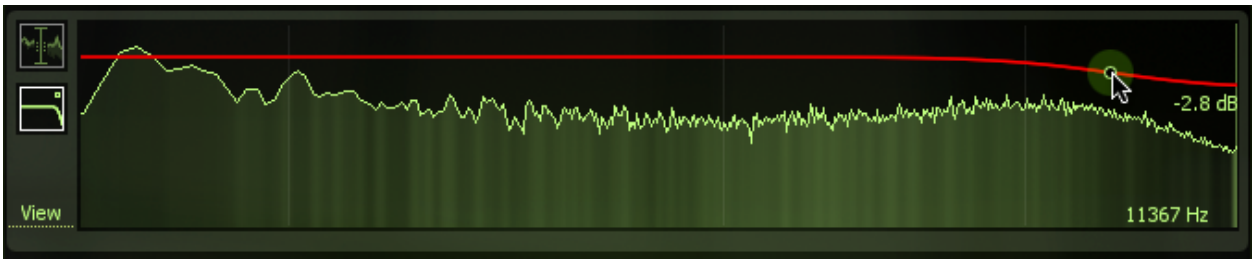
Like controls on other screens, you can use arrow keys to adjust a selected slider, or the wheel of a wheel mouse, or double-click on the numeric label and directly enter a value with the keyboard. You can reset a slider by double clicking on it.

Oversampling: Utilizes more processing power to increase quality (CPU intensive).

Mini-Spectrum Window

The meter at the top of the module defaults to a display of the signal spectrum. However, with a selection on the left it may also display the Saturation Meter.

Saturation meter: displays the spectrum of the incoming signal, but additionally highlights particular frequencies being affected by the exciter and features the post filter curve. The frequencies being affected by the exciter are shaded in solid green across the spectrum. The post filter is an adjustable high shelf filter on the saturation meter that allows you to adjust the frequency output of the exciter module.

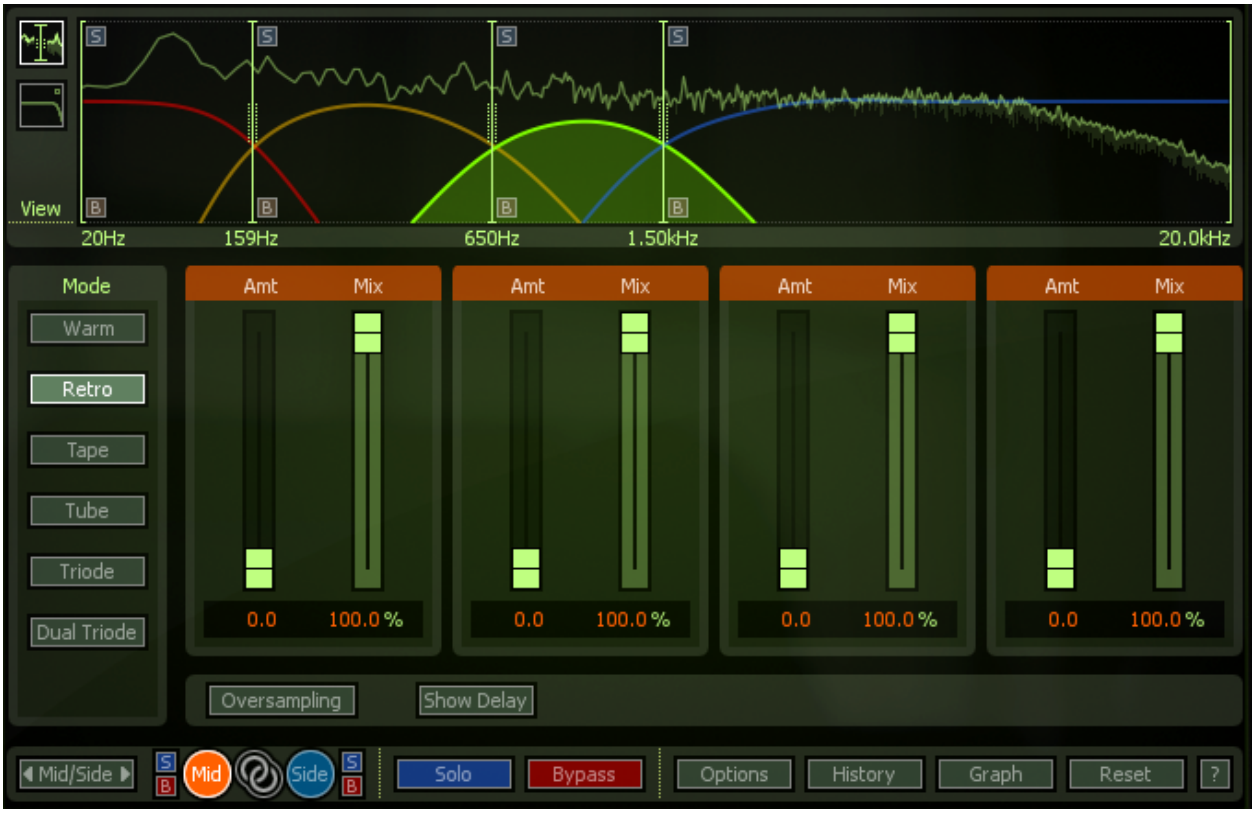


Mid-Side Support

Stereo/Mid-side: This button allows you to switch between "stereo" processing or "mid-side" processing. When "stereo" is selected, the Ozone module will perform basic stereo signal processing. When "mid-side" is selected, all mid-side features become available.

Colors

To make it easier to distinguish between Mid and Side modes, the interface highlights have designated colors. Mid mode is presented as orange, and Side mode is presented as dark blue.



Example using Mid-Side Processing in Ozone's Harmonic Exciter

Mid-Side processing allows you to separate a specific frequency range into its Mid and Side components and apply processing separately to the Mid (center) channel, or the Sides of your mix.

For example, using the Side channel in the Harmonic Exciter module (blue), try selecting the upper frequency bands for your mix. By increasing the amount sliders for the upper frequencies you will be applying the exciter to the extreme edges of your mix only and leaving the Mid (center) channel as-is.

To learn more about Ozone Mid-Side Processing controls, click here...

[ADV] Component Harmonic Exciter Plug-in

If you are using Ozone 5 Advanced you will also have the ability to instantiate Ozone 5's Harmonic Exciter module as an individual component plug-in. Ozone 5 Advanced includes component plug-ins for all six of Ozone's modules complete with all the same features as the module within Ozone. Any module presets saved within Ozone will open within the component plug-ins' module preset system.

Dynamics

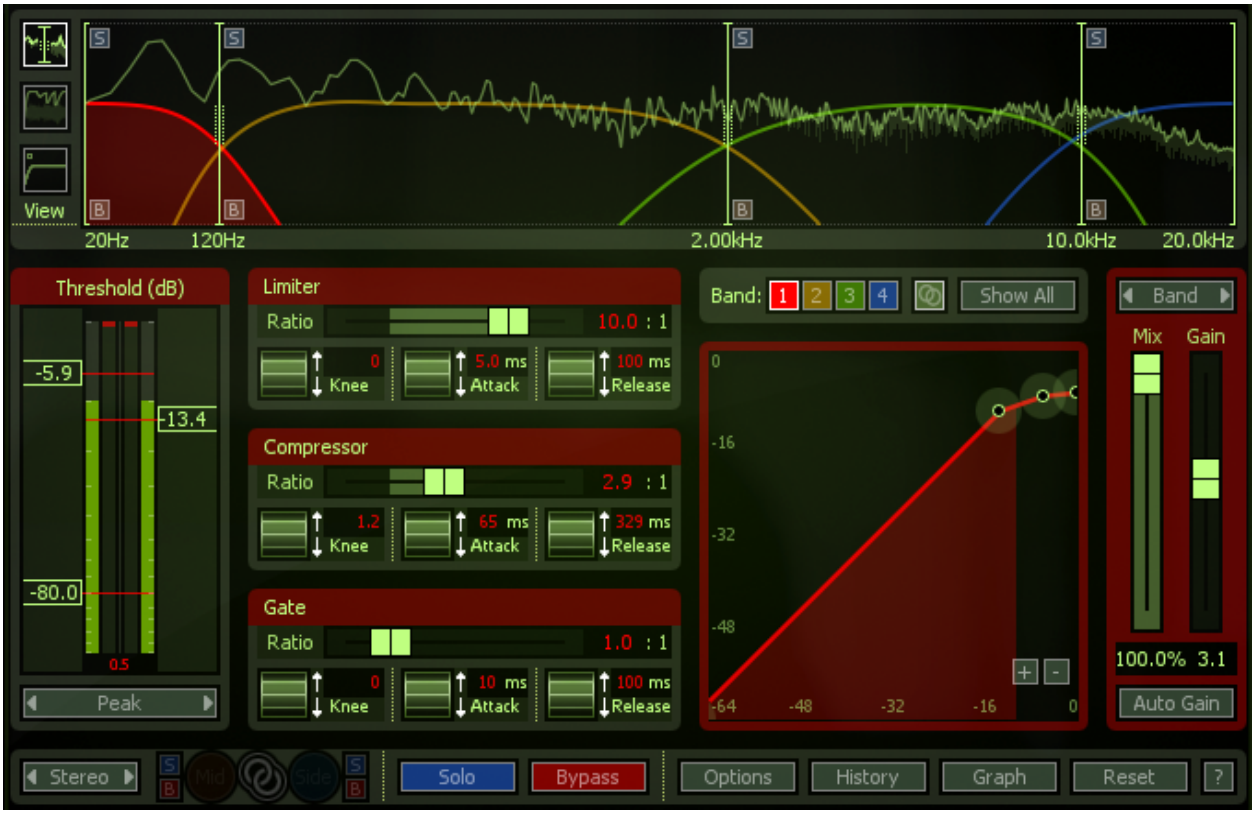
One of most powerful modules in Ozone is the dynamics section. You can use this module to shape the dynamics of your mix with up to four bands of analog-modeled compression, limiting, gating and expansion.

Key Features

- Apply dynamics processors selectively to different frequency ranges, and even to the center and edges of the sound stage with mid/side processing
- Automatic Gain Compensation provides automatic makeup gain, and also allows you to easily compare your mix with and without dynamics processing applied
- New metering features including interactive Threshold Control with input/output gain reduction and histogram options, and the Gain Reduction Trace Meter
- Hard or soft knee operation

Ozone Advanced Exclusives:

- Detection Filter with high-pass and tilt modes for fine control over how the dynamics module responds to incoming audio (especially useful for single-band operation)
- Advanced detection circuit modes with Peak, RMS, and True Envelope detection as well as variable Look-ahead time
- Variable knee for detailed control over hardness or smoothness of gain reduction



How to use Ozone Multiband Dynamics

Each band has its own controls for controlling the dynamics. There can be up to four bands, as shown by the sections in the multiband section at the top.

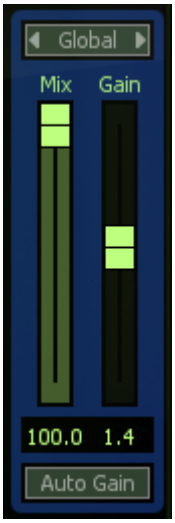
To select a band, click on its corresponding section in the multiband spectrum or its corresponding band number in the top right of the window. The controls and dynamics meters will be updated to display the currently selected band.

Each band of dynamics is capable of three types of dynamics processing. Limiting, compressing, and expanding. This allows you, for example, to aggressively limit high level signals, apply more gentle compression to medium level signals, and/or boost (expand) the level of soft signals. The combination is such that you can tighten the dynamic range by compressing "from the top", by expanding "from the bottom", or a combination of both.

Band/Global: This toggles the Gain and Mix settings between "global" mode and "band" mode. Global mode affects the entire frequency range of your mix while band mode will only affect the frequency range of the currently selected band.

Mix: This is a wet/dry mix for compressor output. This is available for individual bands and/or globally for the entire frequency spectrum.

Gain: Adjusts the output gain of either the band or the entire module. This is useful, for example, after compressing or limiting a band to makeup the decrease in volume.

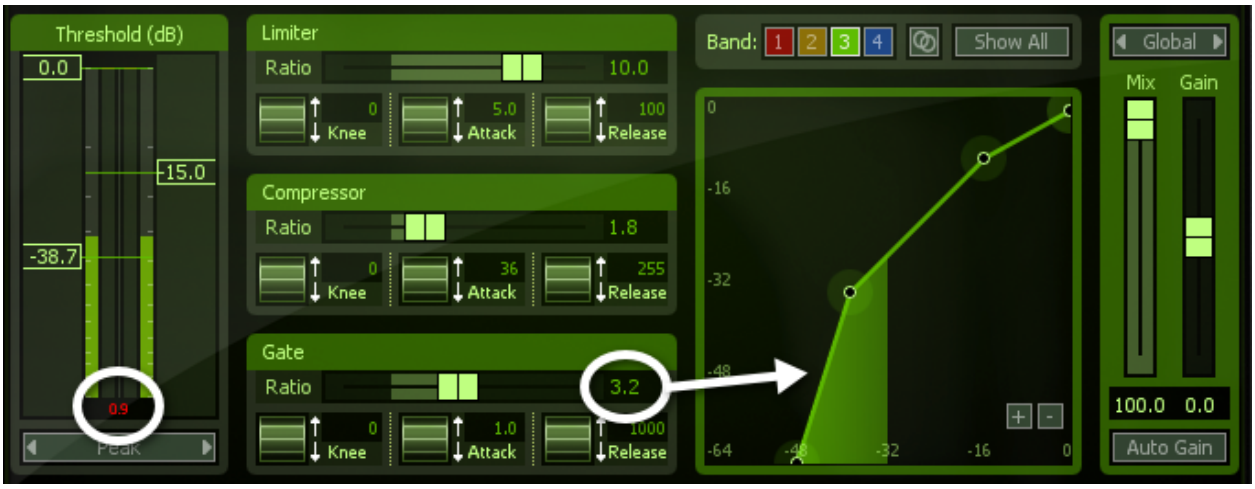


Auto gain compensation: When selected, AGC calculates RMS levels of both the input and output signals of the compressor for each crossover band and applies the appropriate gain to the output signal to compensate for the difference. This automatically brings audio levels to a level comparable to the unprocessed audio, and acts as a smart “make-up gain” control that adapts to the mix over time.

This is also a useful tool for A/B'ing various settings in the multiband dynamics module without having gain changes affect your perception.

Threshold: Set the point where the dynamics processing takes place.

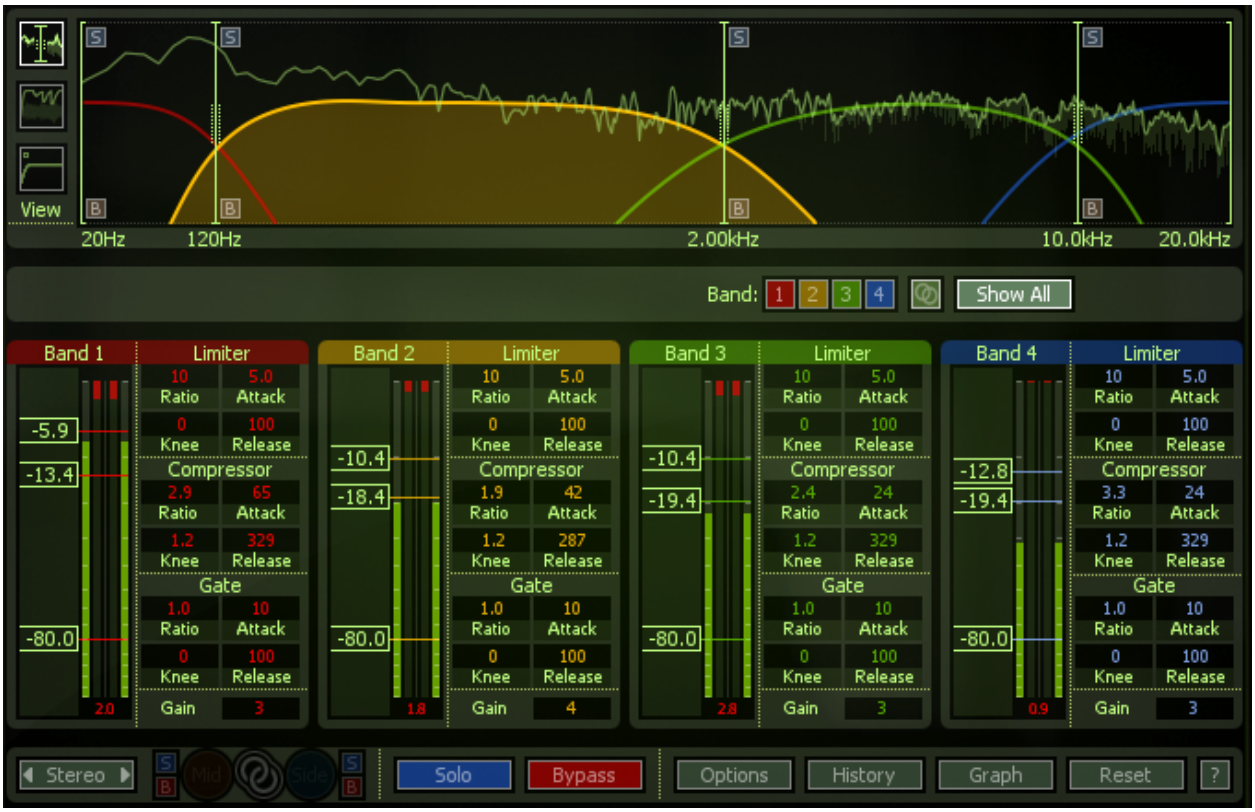
Ratio: Sets the ratio for the limiting. Higher ratios will result in more extreme compression or expansion. The expander can have a ratio greater or less than 1.0. When the ratio is greater than 1, it is operating as a gate and any signals below the threshold will be decreased in volume. With a high positive ratio it can act as an effective multiband noise gate, as shown below.



Attack and Release: Adjusts how quickly the dynamics processor reacts to the threshold. Attack determines how quickly the dynamic processor reacts when the threshold is reached. Release determines the amount of time before the dynamics processor returns the level to normal once the signal no longer reaches threshold.

Note: Each section (limiter, compressor, and expander) of each band can have its own attack and release settings.

Show All Bands mode: Ozone 5 now allows you to view and adjust the dynamics settings for all bands in one easy to use window. Clicking Show All next to the band selection buttons in the top right reveals a window that displays the threshold, ratio, attack, and release for the limiter, compressor, and expander for each individual band in one screen.



Linked Bands Mode: Selecting Linked Bands Mode allows you make changes across all bands by adjusting the settings of one band.

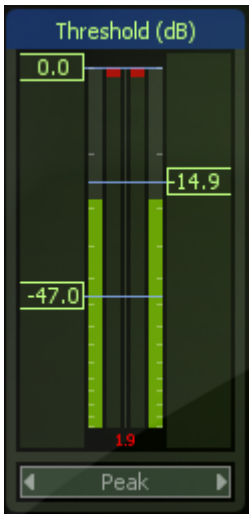
Visuals

The Threshold Control is a meter that allows you to adjust the thresholds of the expander, compressor, and limiter with sliders on the left and right side. Additionally, the Threshold control allows you to monitor how the incoming signal is being affected in real time.

The Threshold Control can display gain reduction as it is taking place with level meters. To enable the gain reduction meters, right- (or control-) click on the threshold control's meter window and select Dynamics options. From the Dynamics options page select Gain Reduction from the Threshold Meter drop-down menu. Two meters display the levels of the incoming signal and as gain reduction begins to take place, a gain reduction meter appears in red between the two level bars. The Threshold meter also displays the amount of gain reduction in real-time with a dB readout at the bottom.

The Threshold Control can also display a Histogram, a history of level over time. To enable the histogram, right- (or control-) click on the threshold control's meter window and slect Dynamics options. From the Dynamics options page select Histogram from the Threshold Meter drop-down menu. This allows you visualize the overall "level content" of the audio by providing a running display of the history of levels in the audio.

Learn more about gain reduction meters and histograms here.

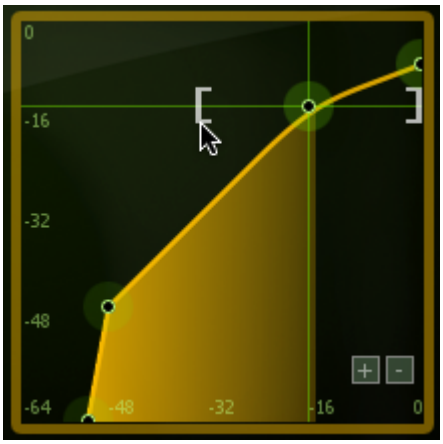


The button at the bottom of the Threshold Control allows you to adjust level detection mode which is explained later.

Dynamic Curve Meter shows the input signal (x axis) plotted against the output (processed) signal (y axis). More horizontal compression curves means the signal is being flattened (compressed) more. You can zoom in and out on the meter by clicking buttons in the bottom right.

Nodes:
The meter features individual nodes for the limiter, compressor, and expander as well as nodes surrounding these that represent input and output. These nodes are linked to the Threshold and Ratio controls, and can be used to adjust the curve in a visual way, rather than setting them with the standard controls.

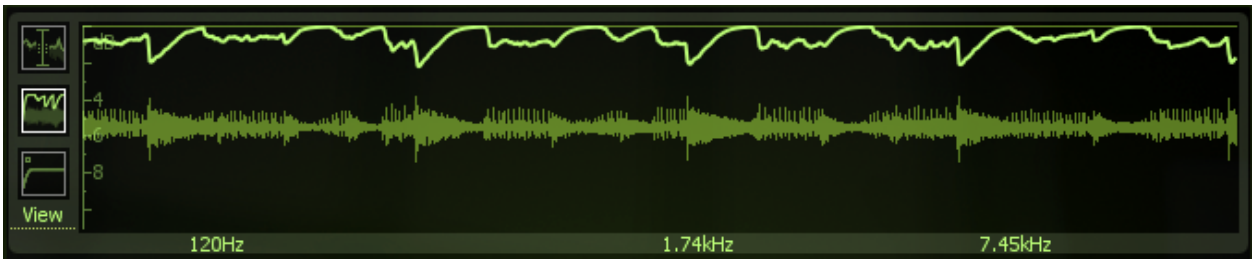
[ADV] **Advanced Nodes:**
You may variably adjust the knee of each stage of the dynamics process from hard to soft with horizontal handles that appear when a node is selected.



Additional Metering and Controls

At the top of the dynamics module is the meter that as a default displays the Mini Spectrum and the crossovers used for multiband processing. You can also click the buttons to the left of the window to view Gain Reduction Trace meter and Detection Filter (Ozone Advanced).

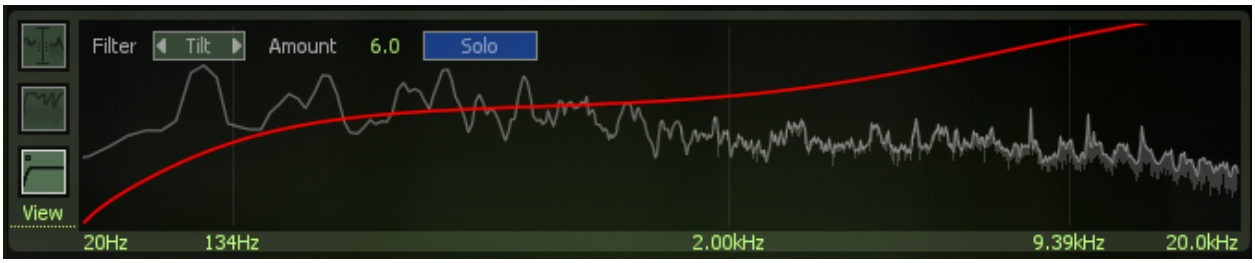
Gain Reduction Trace: a scrolling meter that displays the incoming signal's waveform with a superimposed curve that illustrates the amount of gain reduction taking place in real-time. When using multiband processing, the current selected band's gain reduction is drawn imposed on a waveform of only that band's signal. The Gain Reduction Trace can help you to set attack and release controls appropriately and monitor the envelope of gain reduction.



Note: You can adjust the scale on the left by hovering over it and using your mouse wheel.

[ADV] Detection Filter

This feature new to Ozone allows you to specify the frequency response of the detection circuit used by the dynamics processor so it is less sensitive to lower frequencies. You can choose between high pass mode as well as Tilt mode and adjust each accordingly with settings to the right.



Detection Filter modes

None – detection circuit is equally sensitive across all frequencies.

High Pass – applies a high pass filter to the detection circuit so low frequencies do not trigger dynamics processing. You may adjust the cutoff frequency of the filter as well as the slope with controls on the right.

Tilt – similar to the "THRUST" circuit found on API compressors, Tilt mode preserves low frequencies using a high frequency weighted filter curve. You may adjust the amount of slope in the filter curve by adjusting the Amount value.

Solo - By selecting Solo you may hear the signal that the detection circuit is using to trigger the dynamics module.

Mid/Side Support

Stereo /Mid/side: This button allows you to switch between stereo processing or mid/side processing. When Stereo is selected, the Ozone module will perform basic stereo signal processing. When Mid/Side is selected, all mid-side features become available.

Colors

To make it easier to distinguish between Mid and Side modes, the Dynamics Interface has designated colors. Mid mode is presented as orange, and Side mode is presented as dark blue.

Example using Mid-Side Processing in Ozone's Multiband Dynamics
When dealing with multiband compression on a stereo mix, it is sometimes difficult to apply processing to a specific instrument or vocal if they are too close in frequency. In these cases, Mid-Side processing reveals more refined control by allowing you to separate a specific frequency range into its Mid and Side components and apply compression separately to the Mid (center) channel, or the Sides of your mix. There are many uses for Mid-Side processing using compression.

For example, this can help prevent other instruments from being affected by compression on the lead vocal, since the vocal is usually in the center of your mix and other instruments are typically found at the sides of your mix.

To learn more about Ozone Mid-Side Processing controls, click here...

Additional Settings

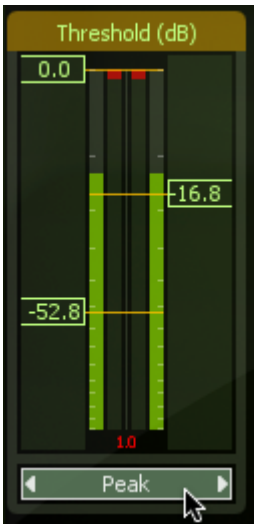
Level Detection

Below the Threshold Meter is a selection box which determines what levels the dynamics module's detection circuit looks at:

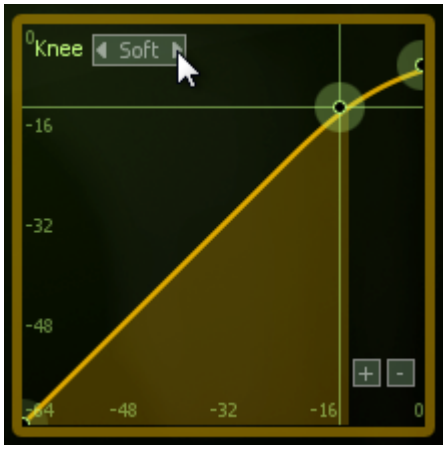
Peak: When this option is enabled Ozone acts as a peak compressor/limiter/expander. This means the detection circuit looks at peak levels of the incoming signal. In general this is useful when you're trying to even out sudden peaks in your music.

RMS: When this option is enabled, Ozone looks at the average level of the incoming signal. RMS detection is useful when you're trying to increase the overall volume level without changing the character of the sound.

[ADV] **True Envelope:** New to Ozone 5, True Envelope mode behaves much like RMS mode, but with some key advantages. Unlike RMS, True Envelope mode produces even levels across all frequencies. Additionally, True Envelope mode will not produce the aliasing or artifacts that RMS detection can cause.



Knee: If you are not using Ozone 5 Advanced, you may select either hard or soft knee dynamics processing from a selection box in the top left of the Dynamic Curve Meter. In Ozone Advanced, a variable knee control is available for each dynamics stage in each band.

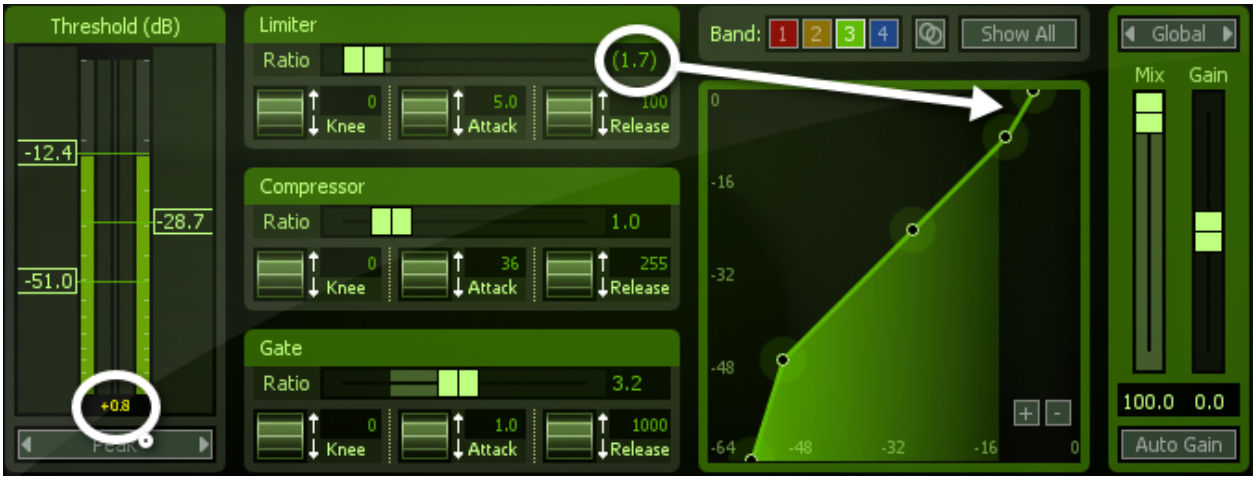


[ADV] **Look-Ahead Time Control:** The Look-ahead function allows for smoother gain changes with quicker attack rates. The longer the amount of look-ahead, the smoother the dynamics processing will be, however Ozone will introduce more latency into the signal path in your host program. You may adjust the amount of look-ahead time in the Dynamics Options Tab.

Upward Compression and Expansion

Ozone's dynamics module now allows for ratios of less than 1:1 in all of the dynamics stages. At the gate and compressor stage a ratio of less than 1:1 performs upward compression. This raises the levels of anything that falls below the threshold. Upward compression can gently raise levels instead of pushing down peaks.

At the limiting stage a ratio of less than 1:1 performs upward expansion which can be seen below. This process actually raises the level of anything that reaches the threshold. Upward expansion can be used to add punch to dull mixes or emphasize the beat in rhythm-heavy music.



[ADV] Component Dynamics Plug-in

If you are using Ozone 5 Advanced you will also have the ability to instantiate Ozone 5's Dynamics module as an individual component plug-in. Ozone 5 Advanced includes component plug-ins for all six of Ozone's modules complete with all the same features as the module within Ozone. Any module presets saved within Ozone will open within the component plug-ins' module preset system.

Stereo Imaging

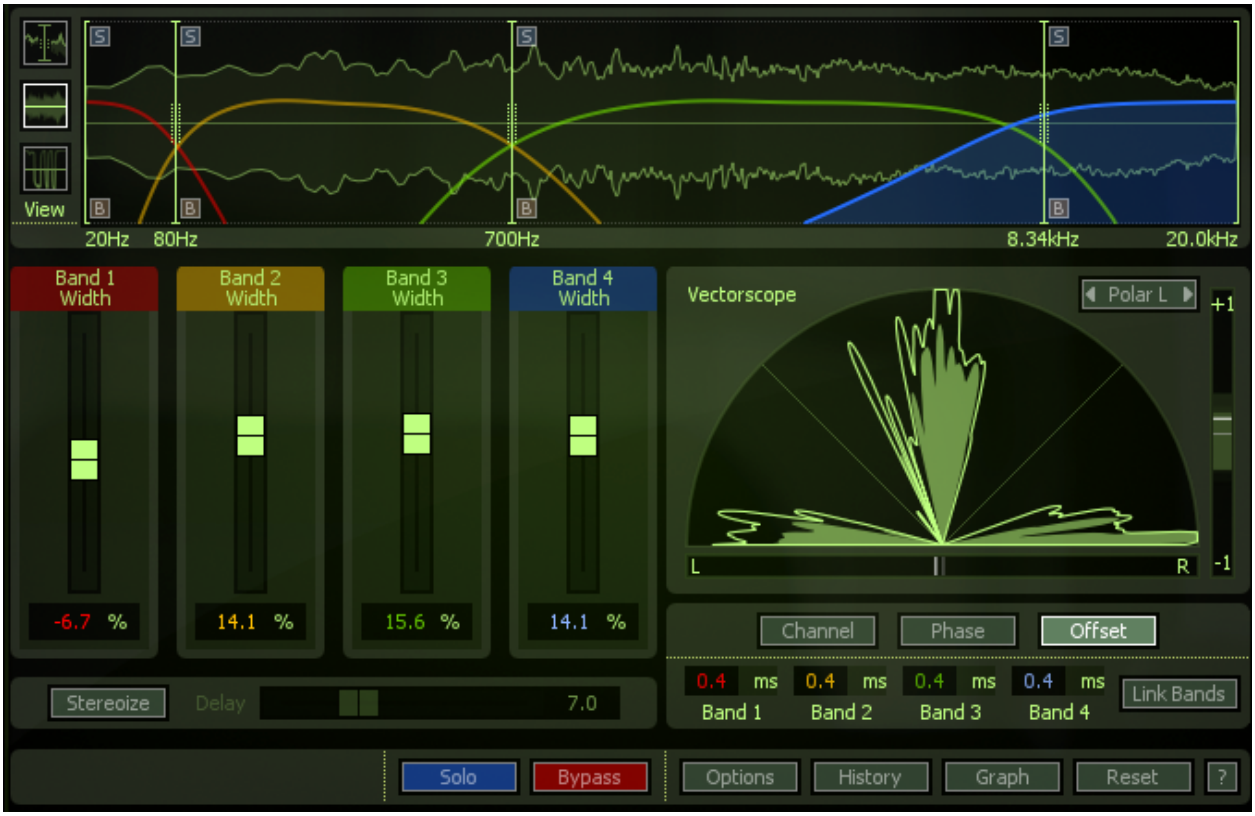
Ozone allows you to set widening and imaging for the mix using a multiband stereo imaging module. As with the other multiband modules in Ozone (Dynamics and Harmonic Exciter) the module is split up into four bands determined by the multiband crossover points displayed on the spectrum.

Key Features

- Provides up to four bands of widening for adding space to your mix
- Apply multichannel delay controls to adjust the perceived location of the stereo field
- Visualize the stereo image with Vectorscope and Correlation meters as well as new Width Spectrum View and Correlation Trace View to help you troubleshoot potential phase problems

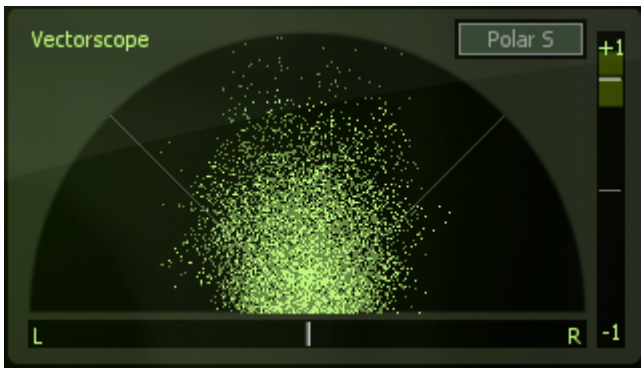
Ozone Advanced Exclusives:

- Stereoize feature adds stereo width to mono or narrow recordings. When in Stereoize mode, the Width controls for bands 1-4 introduce a natural-sounding widening effect.



Band Widening: These controls set the amount of stereo widening for each band. Higher amounts provide more widening: -1.0 (mono) to 1.0 (full widening)

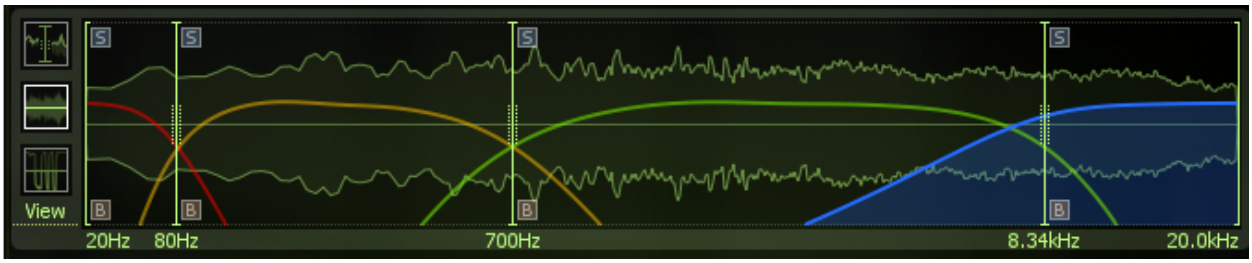
Meters: The Stereo Imaging module provides a view of the stereo imaging field through the Correlation meter and Vectorscope.



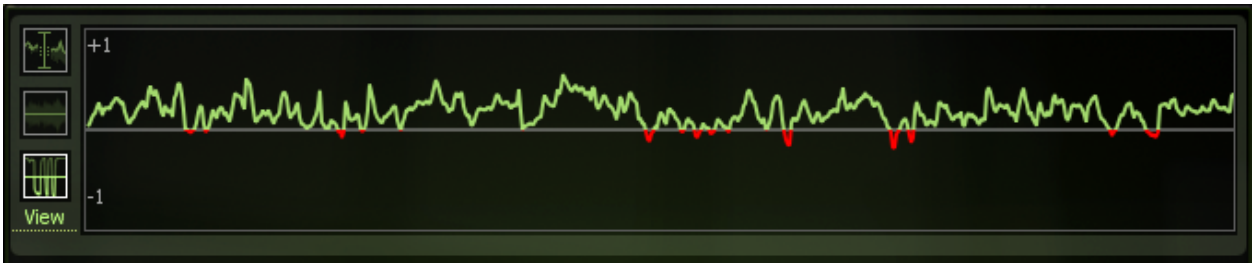
Mini-Spectrum Window

The window at the top of the module defaults to a display of the signal spectrum. However, with selections on the left it may also display the Stereo Width Spectrum as well as the Correlation Trace.

Stereo Width Spectrum: a mirrored spectrum display of the incoming signal's stereo width by frequency superimposed on the multiband crossover display.



Correlation Trace: a scrolling tracing of the incoming signal's stereo correlation drawn in real-time. Positive (in phase) values are drawn in grey while negative (out of phase) values are drawn in red.



[ADV] **Stereoizer**: This Ozone 5 Advanced exclusive feature uses stereo synthesis to add natural-sounding stereo width to mono or narrow recordings. The Stereoizer's stereo synthesis effect allows mono capability to be retained throughout the process. By adjusting the delay control in conjunction with the Width sliders you may control the character of the stereo effect. In addition, the Stereoize effect is totally mono-compatible—even if you add width to audio, it can still be played back in mono without producing unpleasant artifacts.

[ADV] Component Stereo Imaging Plug-in

If you are using Ozone 5 Advanced you will also have the ability to instantiate Ozone 5's

Stereo Imaging module as an individual component plug-in. Ozone 5 Advanced includes component plug-ins for all six of Ozone's modules complete with all the same features as the module within Ozone. Any module presets saved within Ozone will open within the component plug-ins' module preset system.

Maximizer

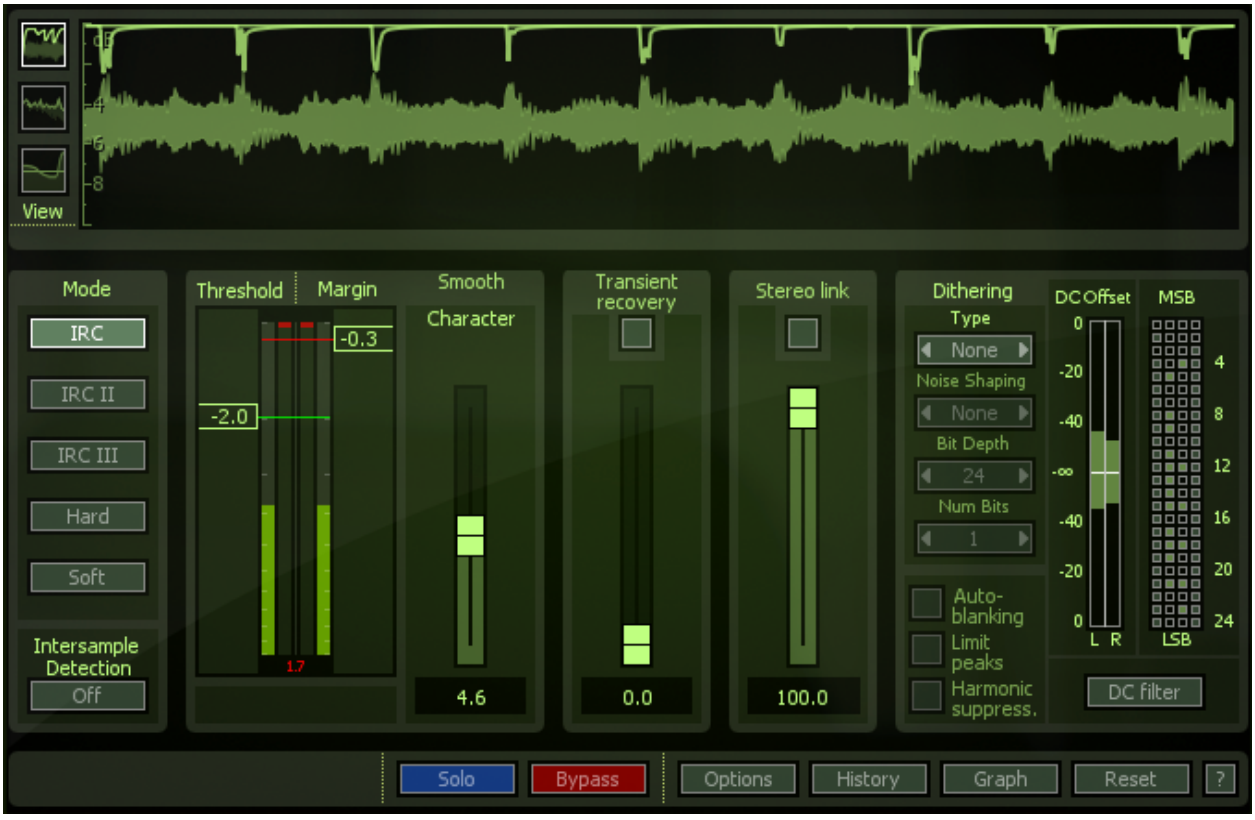
The Maximizer allows you to create an overall louder or fuller master by limiting the dynamic range and boosting the perceived overall level of the mix. Ozone's acclaimed IRC (Intelligent Release Control) Loudness Maximizer lets you boost the level of your mixes without sacrificing dynamics and clarity. The Maximizer applies to the entire bandwidth of the mix and is not a multiband effect.

Key Features

- Intelligent limiting modes provide amazing results, greatly reducing pumping on transients and letting you get louder, fuller mixes without unwanted artifacts
- Character control helps you fine tune the Maximizer's response perfectly to your source material
- Gain Reduction Trace provides valuable visual feedback of gain reduction
- Interactive Threshold/Margin control allows you to adjust the amount of limiting in visual relation to the level of the incoming signal
- Stereo Link feature allows you to limit the left and right channels independently

Ozone Advanced Exclusives:

- Transient Recovery feature allows you to preserve transients through limiting



Limiting Modes

IRC I: This mode provides intelligent digital loudness maximization of the signal. Unlike the analog modeled limiters (Soft or Brickwall), the Digital processor is designed for neutral or

transparent limiting. It does this by analyzing the source material and applying limiting in a psychoacoustically-pleasing manner, reacting quickly to transients (to prevent pumping) and reacting more slowly to steady bass tones (to prevent distortion).

IRC II: Similar to Intelligent mode (above), but this mode is optimized to preserve transients even more, so they sound sharper and clearer in the output signal, even when aggressive limiting is taking place.

IRC III: This is a new processing mode for Ozone 5. Intelligent III mode allows for the most aggressive limiting by using an advanced psychoacoustic model to intelligently determine the amount of limiting that can be done to the incoming signal before producing distortion that is detectable to the human ear. It is however, very CPU intensive and with high latency especially at higher sampling rates. You may find that at sampling rates greater than 48kHz you are unable to use Intelligent III mode in real-time.

Hard: The hard limiter uses the Margin point as an absolute guide, and the final output level will not exceed this point.

Soft: The soft limiting algorithm uses the Margin (or final output level) as a guide but not as a fixed limit for the output level. It provides a natural "soft" limiting effect at the expense of allowing the level to exceed the margin.

Limiting Controls

Threshold: Determines the point that the maximizer will begin limiting. Turning down the threshold limits more of the signal which in turn will create an overall louder mix. In other words, by turning down the Threshold you limit the dynamic range of the mix, and the maximizer automatically adds gain proportionally to maximize the output level.

Margin: Determines how much to boost the output signal after limiting. If the Margin is set to 0 dB, the signal will be boosted all the way up to 0 dB. If the Margin is set to -0.3 dB, makeup gain will be applied until the output signal is at -0.3 dB. Note that in the Soft mode, the level may be allowed to cross the Margin setting, while in Intelligent or Hard modes the Margin serves as an absolute "stop" point.

Intersample Detection: Intersample Detection enables “True Peak” limiting by examining not just the levels of each digital sample, but the levels of the analog signal that will eventually be produced by D/A conversion. This is sometimes necessary, since an analog signal's peak level can exceed its corresponding digital signal's peak level by more than 3 dB! This option will increase CPU usage slightly, but if your mixes are running very hot you may want to enable it to ensure that absolutely no distortion is introduced when your audio is finally run through a D/A converter.

Note: Different True Peak meters have different oversampling algorithms and may produce slightly different level readings. Ozone 5 strictly limits true peaks using its own TP measurement. For compliance with other possible True Peak meters it is recommended to leave 0.1 dB of headroom

Release: When the Maximizer is set to Soft or Hard mode, this is the release time for the limiting. In general, more extreme limiting will benefit from longer release times.

Character: The IRC modes provide intelligent release control (the release time is automatically varied depending on the audio material). When using the Intelligent modes the release slider is replaced by a Character slider. This control allows you to modify the behavior or "character" of the limiter, by controlling how fast and aggressive it is.

Note: The Character values will not necessarily behave the same between various IRC

modes. Each mode may require additional tweaking of the Character slider to achieve optimum results.

Character Style (IRC3 only): When the Maximizer is set to IRC3 mode you may choose between a number of Character "styles" which will help you manage the limiter's final sound by constraining its release behavior. To achieve the best results, start by adjusting the Character slider with the style set to Balanced, then cycle through the various styles to see which best suits your mix. The following styles may be set:

Pumping - This is the least aggressive style setting for IRC3 and does not constrain the limiter's release behavior. It can tend toward a slower release behavior and may result in pumping. This is the "legacy" setting and is the behavior of Ozone 5.01 and earlier.

Balanced - This setting constrains the release behavior of limiter in a generally transparent way and should be suitable for most material. At a Character setting above 5, it will be identical to "Pumping" and at a setting less than 0.5, it will be identical to "Clipping".

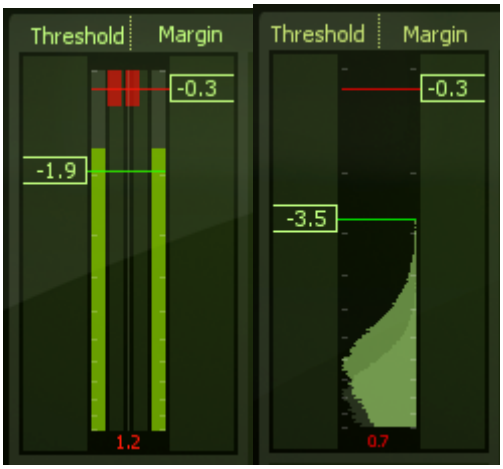
Crisp - This setting aggressively constrains the limiter's release behavior and will favor distortion over any pumping. At a character setting less than 1, it will be identical to "Clipping." This setting may add more "body" to a mix at the risk of occasionally perceivable distortion.

Clipping - This is the most aggressive style setting of IRC3 and may be used if you wish to slightly colorize your mix with distortion or achieve the highest degree of loudness with the greatest risk of clipping.

Visuals

The Threshold Control is a meter that allows you to adjust the Threshold and Margin of the maximizer in visual relation to the levels of the incoming and outgoing signal.

The Threshold Control can display gain reduction as it is taking place with level meters. To enable the gain reduction meters, right- (or control-) click on the threshold control's meter window and select Maximizer Options. From the Maximizer options page select Gain Reduction under the Threshold meter drop-down menu. Two meters display the levels of the incoming signal and as gain reduction begins to take place, a gain reduction meter appears in red between the two level bars. The Threshold Control meter also displays the amount of gain reduction in real-time with a dB readout at the bottom.



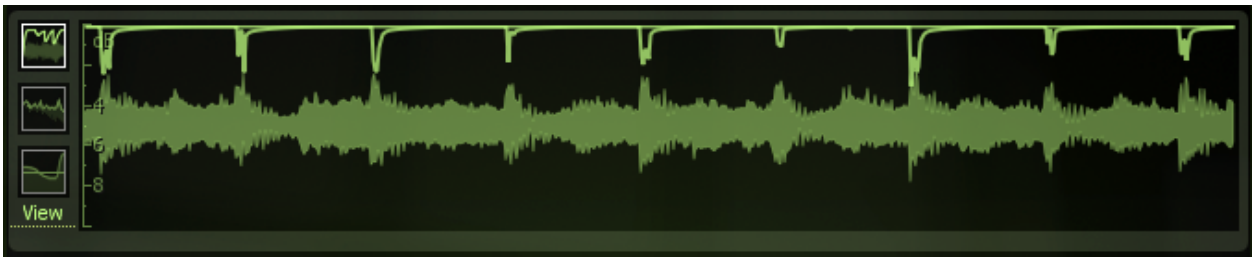
The Threshold Control can also display a histogram, a history of level over time. To enable the histogram, right- (or control-) click on the threshold control's meter window and select Maximizer Options. From the Maximizer options page select Histogram under the Threshold Meter drop-down menu. This allows you visualize the overall "level content" of the audio by providing a running display of the history of levels in the audio.

Learn more about gain reduction meters and histograms here.

Mini-Spectrum Window

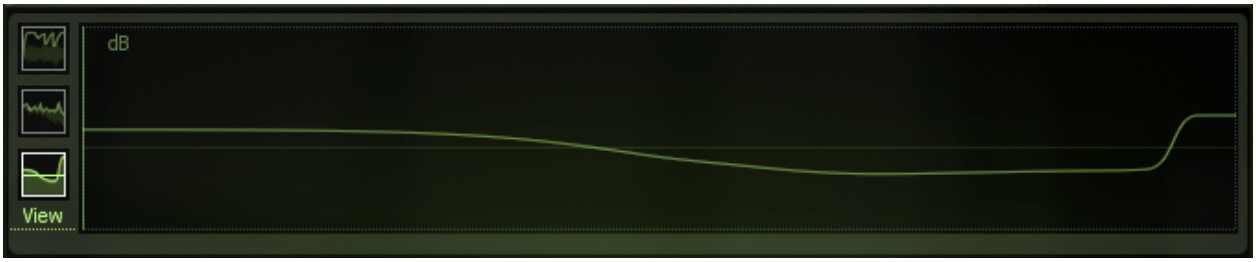
The window at the top of the module features a display of the signal spectrum, however, with selections on the left it may also display the Gain Reduction Trace meter as well as the Dither Shape Display.

Gain Reduction Trace- also found in the Dynamics module, the Gain Reduction Trace is a scrolling meter that displays the incoming signal's waveform with a superimposed tracing that illustrates the amount of gain reduction taking place in real-time. The Gain Reduction Trace can help you to set attack and release controls appropriately and monitor the envelope of gain reduction.



Note: You can adjust the scale on the left by hovering over it and using your mouse wheel.

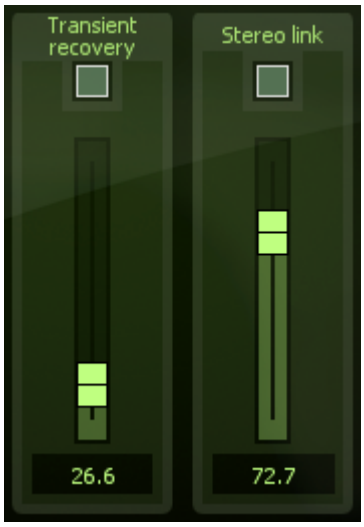
Dither Shape Display- when selected and dither is turned on, this window illustrates the noise shape and amount of the dither being applied.



Note: You can adjust the scale on the left by hovering and using your mouse wheel.

Stereo Link: The Ozone limiter defaults to 100% stereo linking which imposes one limiter across the stereo image. When selected, Stereo Link allows the left and right channels to be limited independently (0%). At values between 0-100, a gain envelope generated by a ratio of the individual channel and the entire stereo image triggers two independent channel limiters. Values less than 50 favor the independent channels' gain and values higher than 50 favor the stereo image's gain.

[ADV] **Transient Recovery:** This feature allows you to fine tune the shaping of transients before limiting takes place helping to preserve sharper sounds like drums while still optimizing loudness. The higher the amount of transient recovery set the more pronounced the transients will be after the limiting process.



Dithering

The active or bypassed state of the maximizer applies only to the Maximizer processor. Dither is independent of the Maximizer. When the Dither type is set to "None", there is no dither or word length reduction applied. To turn dither and word length reduction on, click the "None" button to select MBIT+, Type 1 or Type 2 as the dither type.

[ADV] Component Maximizer Plug-in

If you are using Ozone 5 Advanced you will also have the ability to instantiate Ozone 5's Maximizer module as an individual component plug-in. Ozone 5 Advanced includes component plug-ins for all six of Ozone's modules complete with all the same features as the module within Ozone. Any module presets saved within Ozone will open within the component plug-ins' module preset system.

Dithering

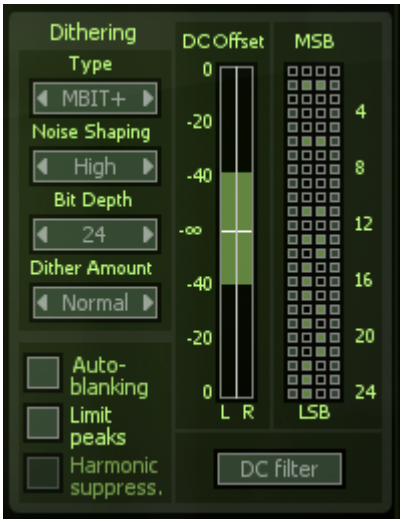
Prepare studio-quality audio for CD and other formats with Ozone's essential dithering tools. Ozone allows you to effectively convert and dither to 24, 20, 16, 12 or 8 bits.

Key Features

- Includes iZotope MBIT+ Dither for exceptionally transparent conversion to different bit depths
- Unique set of bit scopes and DC level meters provides a complete view of the digital bitstream and conversion process

Note: Dither is independent of the Maximizer

To turn dithering on and off, change the Dither type. By default, the dither is off (Type "None"), meaning that your program material is left in the original format. To reduce the bit depth of the material, change the Type from None to MBIT+, Type 1 or Type 2.



When the Type is MBIT+, Type 1 or Type 2, dithering is applied and your audio will be reduced in bit depth to the number of bits selected in the Bit Depth control. The following options are available when reducing the bit depth of the audio.

Type

None: No dither or bit reduction is applied.

MBIT+: This is a proprietary iZotope word length reduction technology that reduces quantization distortion with minimal perceived noise. While this might sound like a paradox, MBIT+ is a very smooth, quiet and almost "analog sounding" technology.

Type 1: Dither is applied using a "rectangular" distribution function. While this provides a dither noise source with a low amplitude, the dither noise can become modulated by the audio signal and vary in level, which is undesirable in many situations. Also, the non-linear quantization distortion is not completely suppressed in some situations with this low dither amplitude.

Type 2: Dither is applied using a "triangular" distribution function. This dither is larger in amplitude and completely suppresses the non-linear quantization distortion.

Shape

By shaping the dither noise, it is possible to provide more effective and transparent dithering by shaping the dithered noise spectrum. There are several different methods for shaping noise so that it is less audible yet still effective. Please refer to our online mastering guide for more information as to the technology behind these methods and how to apply them effectively.

Type 1 or Type 2 Shapes

None: No noise shaping is applied

Simple: High pass filtering is applied to the dithered noise.

Clear: The noise is shifted towards the Nyquist frequency, near the upper limit of our hearing.

Psych 5: A fifth order psychoacoustic shaping is applied to provide dither across the spectrum. The shaping is designed to move the noise away from frequencies that are heard as "louder" at low levels.

Psych 9: A more complex ninth order psychoacoustic shaping is applied.

In general, the "Clear" option is a safe bet for complex program material, although auditioning the dither against the Psych 5 and Psych 9 shapes may be more desirable in some cases.

Note: Psych 5 and Psych 9 shapes are specifically designed to be used on audio with a 44.1 kHz sample rate. For other samples rates, use None, Simple or Clear shaping, or MBIT+ mode which is designed for effective word length reduction at any sampling rate.

MBIT+ Shaping
The MBIT+ dither technology also provides options for noise shaping. You can control the aggressiveness of this shaping, ranging from None (no shaping) through Ultra (roughly 14 dB of audible noise suppression).

Bit Depth

This is the target bit depth for the audio. When mastering for a CD, for example, you would want this set to 16.

Note: Ozone does not perform the actual conversion of the audio. After processing a mix with Ozone, it is necessary to then actually convert the audio to the desired bit depth in the host application.

For example, if you have a 24-bit audio file, you can use Ozone to dither down to 16 bits. The remaining 8 bits are "padded" as zeros. Your file is still a 24-bit audio file, there's just not anything but zeros in the lowest 8 bits. So when you then convert to a 16-bit file in the host app, the 8 bits (that didn't have any audio in them) are discarded.

1. Do not perform any processing to the audio after it has been dithered with Ozone. You may perform level adjustment with the output gain sliders in Ozone (those come before the dither) but do not change any levels in the host app or with other plug-ins. Almost all host apps have their master faders after the effects slot, so any level adjustment in the host app will destroy the dither.

2. Do not put any plug-ins after Ozone if you are dithering with Ozone. The dither must be the last thing that touches the audio.

3. Turn off dithering in the host app. Basically, you just want to truncate (throw away) the bits, because they're just zero anyhow.

Num Bits or Dither Amount
This sets the number of bits or amount of dither that will be used for the dither source. For Type 1 and Type 2 dither, in most cases 1 bit will be sufficient, but in some situations the "over-dithering" obtained by setting Num Bits to 2 can be useful.

"Type 1" and "Type 2" choose flat or high-pass spectrum of dithering noise, while "Num bits" chooses the amplitude of dithering noise. When Num bits = 1, the dithering noise has a rectangular probability distribution (RPDF) between -0.5 and +0.5 LSB (least-significant bit). This amount of dithering eliminates nonlinear quantization distortion, but exhibits modulation of dithering noise amplitude by the signal. When Num bits = 2, the dithering noise has a triangular probability distribution (TPDF) between -1 and +1 LSB. This provides sufficient dither for elimination of nonlinear quantization distortion and amplitude modulation of dithering noise.

In MBIT+ mode, the dithering amount can be varied from None (noise shaping only) to High. No dithering or Low dither amount can leave some non-linear quantization distortion or dither noise modulation, while higher settings completely eliminate the non-linear distortion at the expense of a slightly increased noise floor. In general, the Normal dither amount is a good choice.

Auto-blanking
Selecting this option instructs Ozone to completely mute dither output (i.e. dither noise) when the input signal is completely silent (0 bits of audio) for at least 0.7 seconds.

Limit Peaks
Dither noise is random in nature and has a very low amplitude. However, after noise shaping, especially in aggressive dithering modes, the high-frequency dither noise is significantly amplified, and the overall dither signal can show spurious peaks (up to -60 dB FS for a 16-bit quantization). If such high peaks are undesirable, you can enable the Limit Peaks option to effectively suppress the spurious peaks in the noise-shaped dither.

Suppress Harmonics
If, for some reason, any dithering noise is undesirable, simple truncation remains the only option. Truncation results in harmonic quantization distortion that adds overtones to the signal and distorts the timbre. In this case you can enable Suppress Harmonics option to slightly alter the truncation rules, moving the harmonic quantization distortion away from overtones of audible frequencies. This option doesn't create any random dithering noise floor. Instead it works more like truncation, but with better tonal quality in the resulting signal. This option is applicable only in the modes without dithering noise and without aggressive noise shaping.

Meters
Ozone Dithering module offers a DC Offset meter and a Bit Meter.

DC Offset
It is a good idea to filter out the DC offset from your input before dithering. Again, please refer to our online guide for the background behind this. If you are dithering, turn the DC Offset filter to On. If the button says "On" the DC offset filter is on.

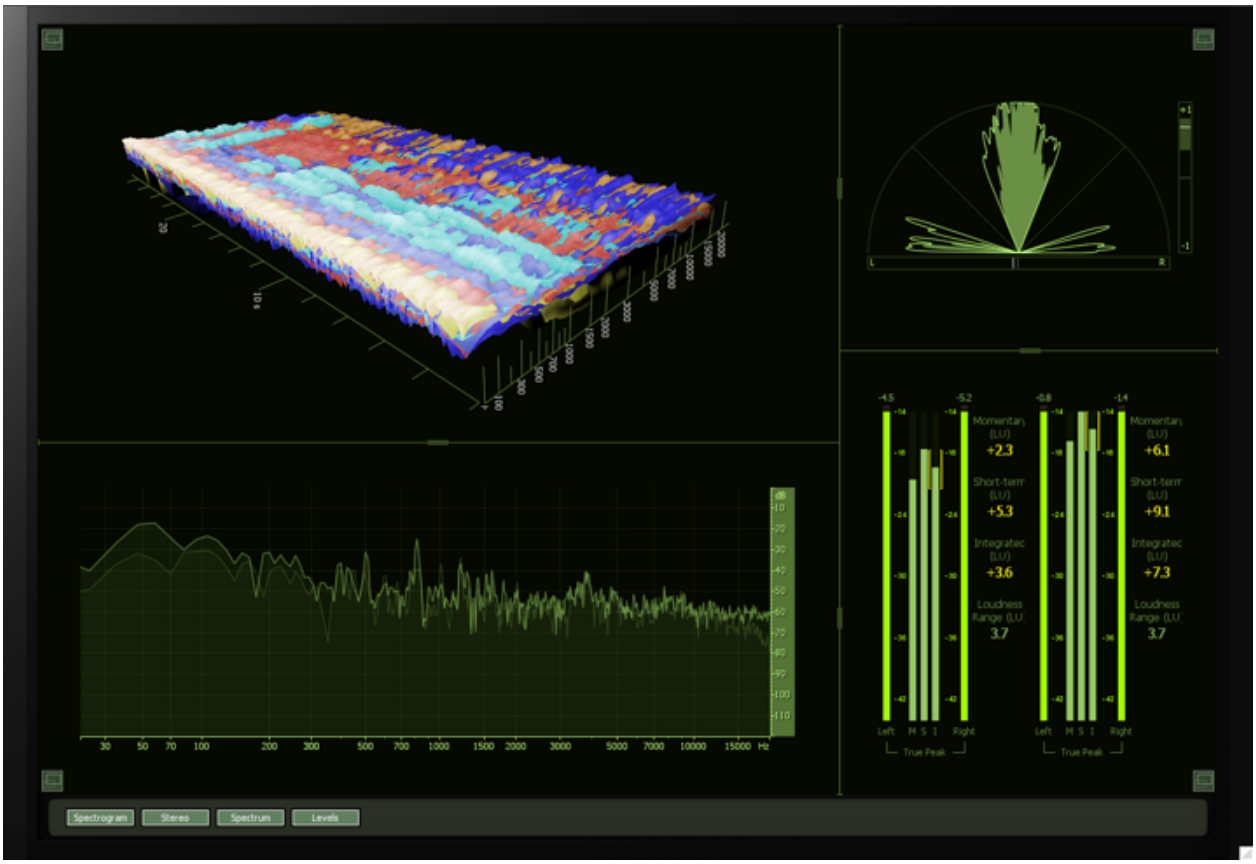
Dithering Guide
If you are interested in getting some practical tips for using dithering, as well as some of the theory behind it, please check out the Ozone Dithering Guide.

Meter Bridge [Ozone Advanced]

Ozone 5's powerful new Meter Bridge provides a full suite of audio analysis tools, perfect for visualizing changes made during the mastering process, troubleshooting problematic mixes, and comparing your mixes to reference tracks. Fully customizable and scalable, the Meter Bridge allows you to visually monitor all relevant information from your mix in a convenient floating window. Featuring a spectrogram, spectrum analyzer, vectorscope, and level meters, the Meter Bridge allows you to keep an eye as well as an ear on your mix at all times. What's more, by using OpenGL, the Meter Bridge doesn't consume CPU, allowing your computer's processing power to focus on audio while harnessing the power of your graphics card for real time metering.

Key Features

- Spectrogram with 2D and 3D options that accurately visualizes frequency information with regard to time and amplitude
- New Spectrum Analyzer modes for better visualizing Mid/Side and Stereo frequency information
- LUFS Loudness metering option compliant with both the ITU-R BS.1770-2 and EBU R128 standards
- Fully customizable with a resizable floating window with scalable meter quadrants as well as independent meter options
- Included Meter Tap plug-in that allows you to route audio streams from anywhere in your session to the Meter Bridge’s spectrogram



Using the Meter Bridge

To open the Meter Bridge window click on the Meter Bridge button below the Input/Output Meters in Ozone 5 Advanced.

Scaling/Maximizing

Each meter's quadrant may be scaled by clicking and dragging the handles on the borders that surround it vertically or horizontally. Additionally, you may maximize the view of an individual meter by clicking the button. When you want to return to the global meter view, simply click the button.

Global View Menu

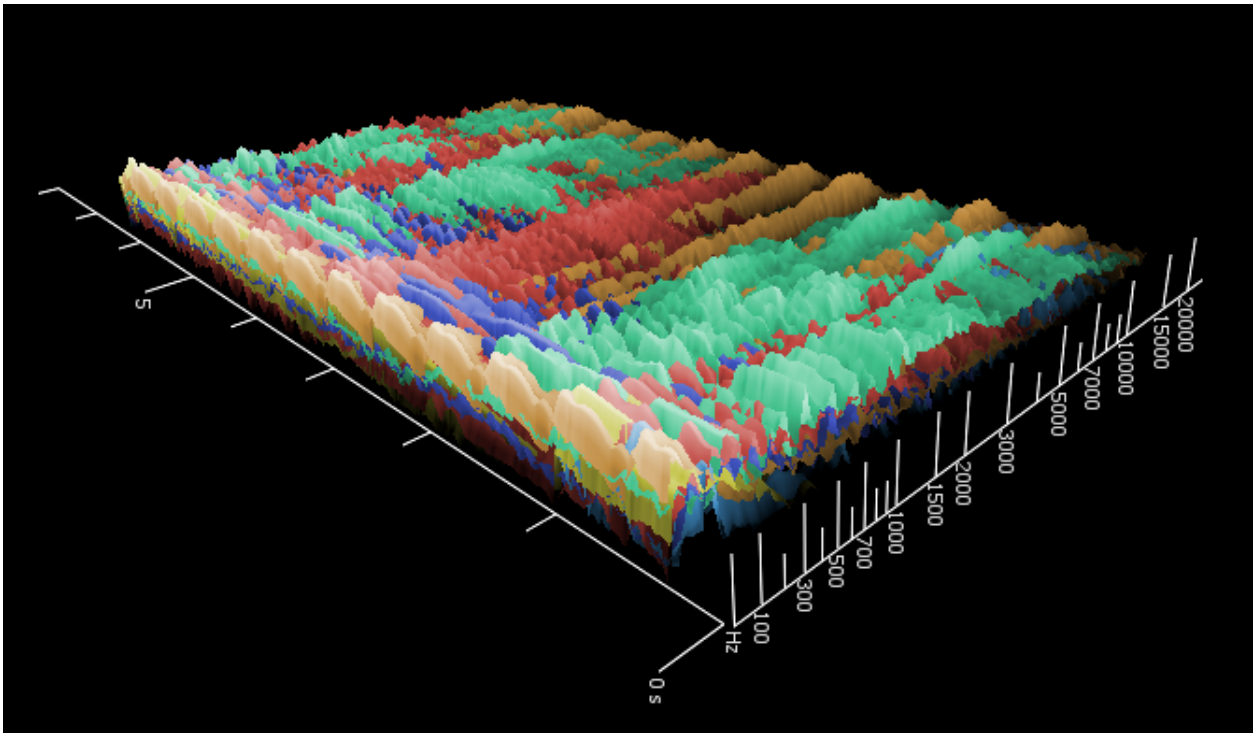
In the bottom left corner of the Meter Bridge is a selection box where you may select which meters you wish to view at any time. Using this menu allows you to customize the Meter Bridge so that it is partitioned into between 1 and 4 meter quadrants.

Options
Within each maximized window is an Options button. Click the Options button to display the various options for that particular meter.

Note: These options may be set independently from the options of the corresponding meters within Ozone's modules. So for example you may have one Spectrum Display mode set within your Equalizer module and another within the Meter Bridge.

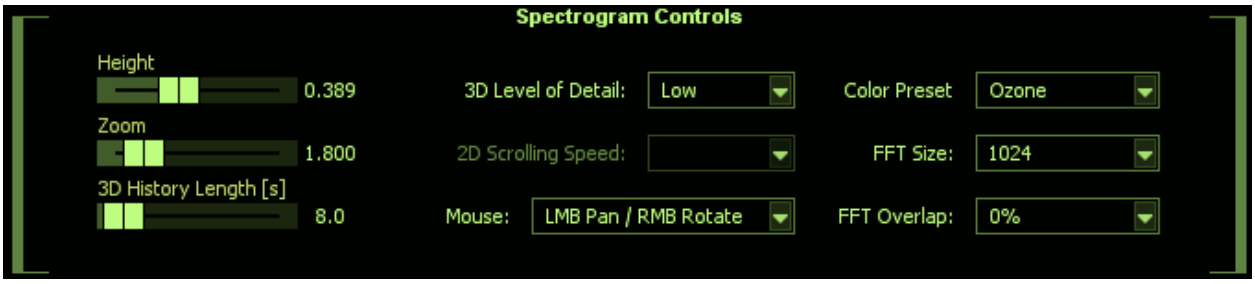
Spectrogram

New to Ozone 5, the Spectrogram draws a two or three-dimensional representation of the incoming signal's spectral information. The traditional 2D spectrogram creates a visualization where one axis represents frequency (x-axis) and the other time (y-axis). Ozone's 3D Spectrogram adds the z-axis to illustrate amplitude. The Spectrogram provides an intuitive way to pinpoint individual elements within your mix. The spectrogram can also display various audio streams simultaneously for analysis in both 2D and 3D modes with iZotope's new Meter Tap plug-in installed with Ozone 5 Advanced.



Spectrogram Options

When the Spectrogram is maximized a number of controls are revealed that adjust how the spectrogram is displayed.



Global Options

2D/3D: You may choose to view a traditional 2D spectrogram by selecting 2D. This will display frequency information vertically (y-axis) and time horizontally (x-axis. Selecting 3D adds the third dimension of amplitude to the z-axis.

View (2D only): This drop-down menu allows you to select how various streams 2D spectrograms are displayed. Choose between overlay which superimposes all spectrogram streams onto one 2D spectrogram, Tile which organizes each spectrogram within two separate horizontal columns, and Stack which displays all spectrograms vertically synced as they scroll horizontally.

View (3D only): You may select between various useful angles of viewing the 3D Spectrogram. Choose between Front High, Front Low, Diagonal, Side High, and Side Low.

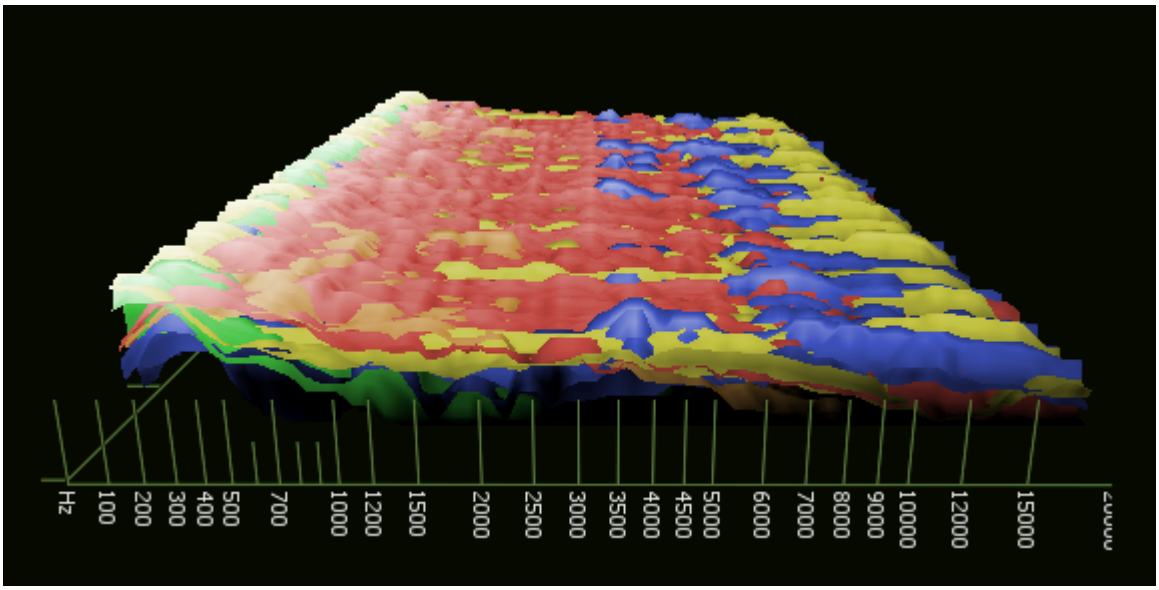
Freeze: At any time you may click the Freeze button to further examine the current state of the spectrogram.

Perspective Options

Zoom (3D only): This slider allows you to zoom in and out on the center of the 3D spectrogram.

Height (3D only): This slider scales the amplitude (z-axis) of the 3D spectrogram allowing differences in amplitude to be greater represented.

Mouse (3D only): This selects whether the 3D spectrogram is panned when clicked and dragged with the left mouse button and rotated when clicked and dragged with the right mouse button or vice versa.



Graphic Options

Color Preset: This selection offers various color setting presets that can display your output spectrogram in useful ways.

FFT Size: This selection allows you to adjust the frequency and time resolution with which the spectrogram is drawn.

FFT Overlap: This selection allows you to adjust how often the spectrum is computed. Higher values compute the spectrum more often.

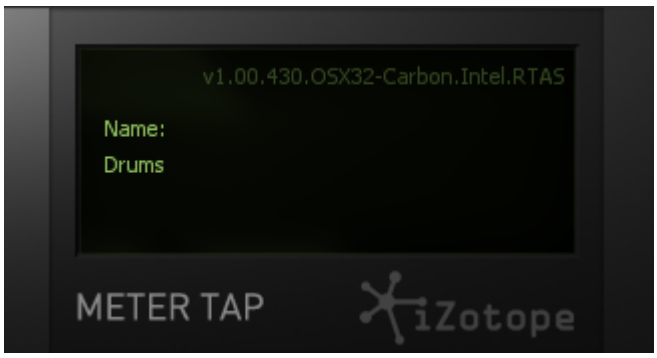
3D History Length (3D only): This slider scales the time (y-axis) of the 3D Spectrogram so that more or less time may be represented at once on the 3D spectrogram.

3D Level of Detail (3D only): This drop-down menu adjusts the level of detail with which the 3D spectrogram displays. You may reduce detail to improve performance.

2D Scrolling Speed (2D only): This drop-down menu offers various time scales that dictate how fast the 2D spectrogram is drawn. The Maximum Info Density option will draw all actual pixels.

Meter Taps

You may now send information from various tracks or busses in your mix to the Meter Bridge's spectrogram with Meter Taps, a new plug-in installed with Ozone 5. Meter Tap plug-ins can be inserted anywhere in your session and will appear in the drop-down menus in the Meter Tap Stream Selection box in the Spectrogram that determine which Meter Tap streams you are visualizing at any given time. The Meter Tap itself performs no processing on your audio and introduces no latency.



Adding Meter Taps to your session

1. Insert a Meter Tap Plug-in on a track or bus in your session.

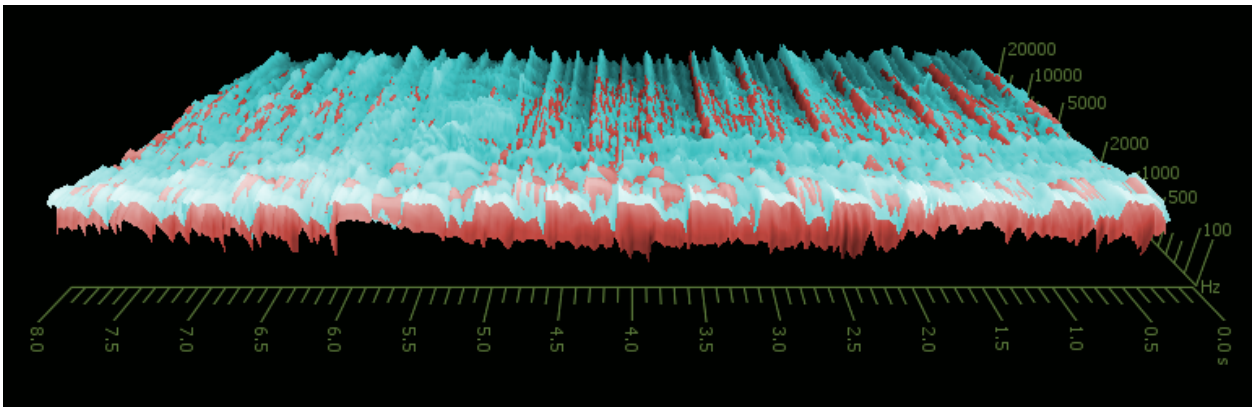
2. Open the Meter Tap plug-in and click on the default name to rename the Meter Tap something appropriate like "Vocals" or "Drums".

3. Open the Meter Bridge window by clicking on the Meter Bridge button within Ozone below the Input and Output meters.

4. Maximize the Spectrogram in the Meter Bridge and click on "Meter Taps" to reveal the Meter Tap Stream Selection Box

5. Click on one of the drop-down menus from the various streams in the selection box and select the appropriate Meter Tap.

6. Adjust the visual options to distinguish the stream from the others in your mix



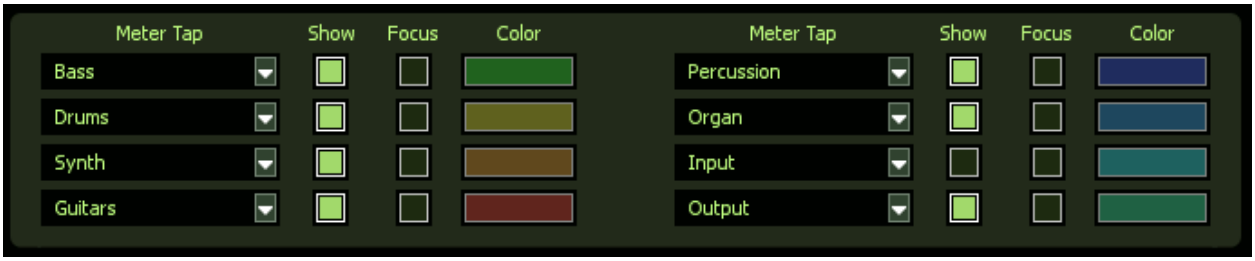
Meter Tap Options

Once you have placed Meter Taps in your session and selected them in the Meter Tap Stream Selection box a number of options for each Meter Tap are available:

Show -This selection toggles whether or not a the information sent from a Meter Tap is displayed by the spectrogram.

Focus - This allows you to highlight a particular Meter Tap stream by drawing all other Meter Taps in greyscale.

Color - This opens a color picker menu that allows you to specify a certain color for each Meter Tap stream.



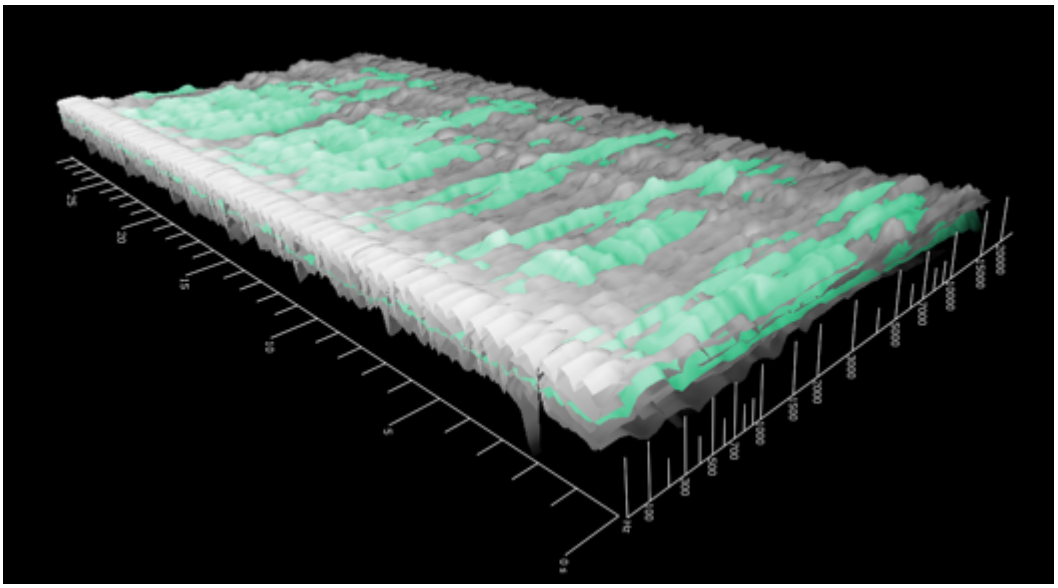
Uses for Meter Taps with the Meter Bridge's Spectrogram

1. Trouble-shoot two voices competing in a mix by placing a Meter Tap on each track in question.

2. Evaluate the signal going into Ozone with Ozone's output by placing a Meter Tap before your Ozone plug-in.

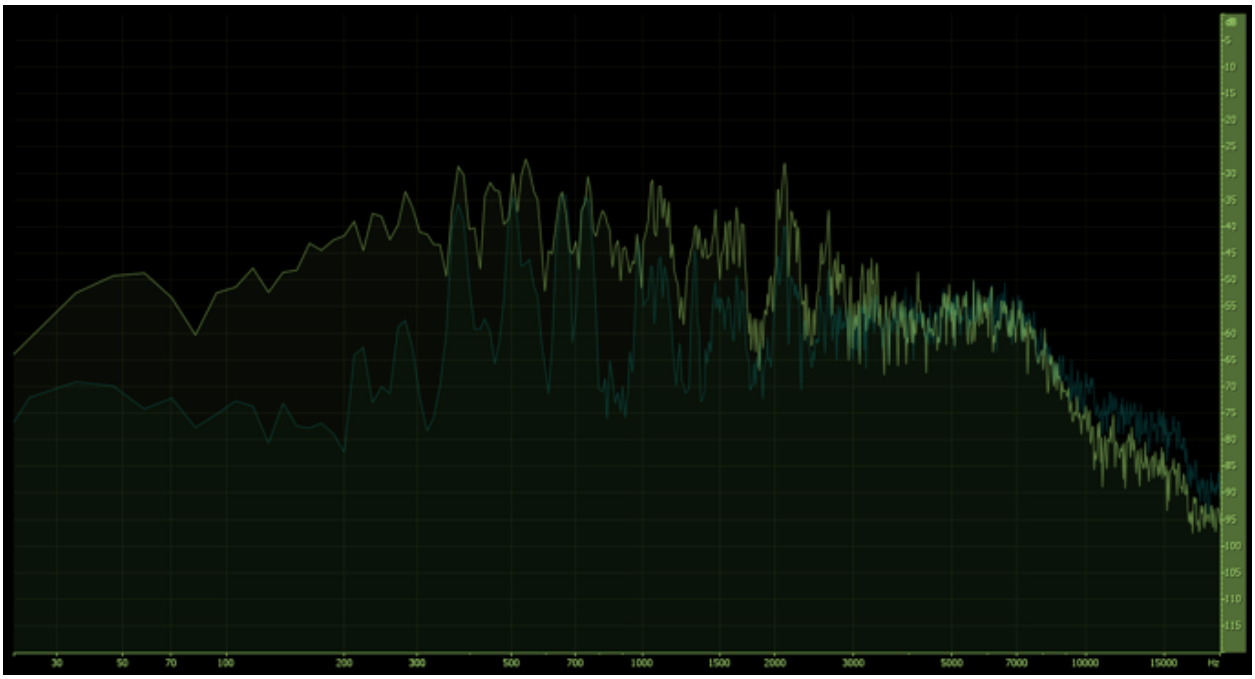
3. Balance a drum mix by placing a Meter Tap on each track that compromises your Drums stem.

4. Pre-mix stems by placing a Meter Tap on each individual stem of your mix.



Spectrum Analyzer

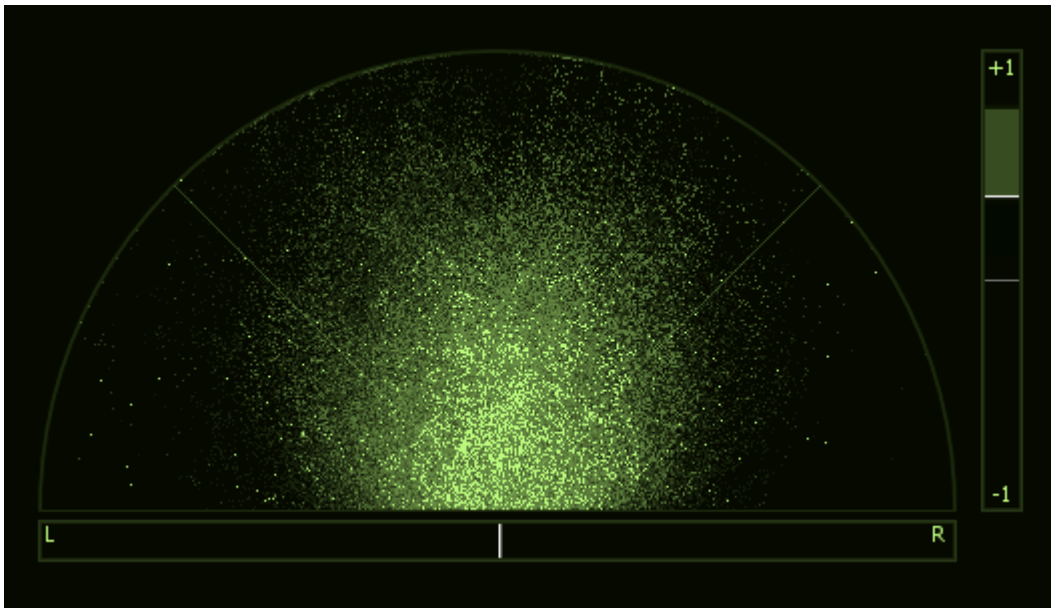
The Meter Bridge features a separate spectrum analyzer that compliments the spectrum analyzer in the Equalizer module. You may now simultaneously view multiple displays of the incoming signal spectrum while using the Equalizer as well as monitor spectrum information throughout the entire mastering process.



You can read more about the Spectrum Analyzer here and its various options here.

Vectorscope

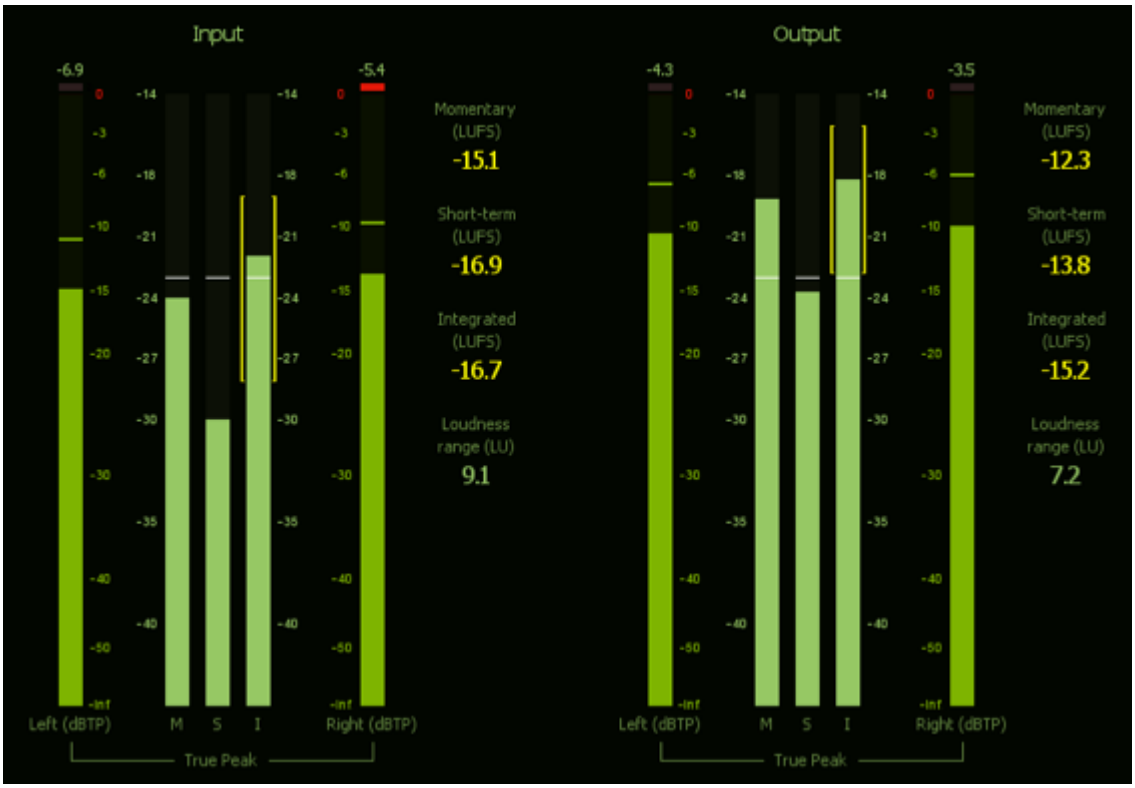
The Meter Bridge features a separate Vectorscope that provides a view of the stereo image of the signal throughout the mastering process.



You can read more about Ozone's Vectorscope here.

Level Meters

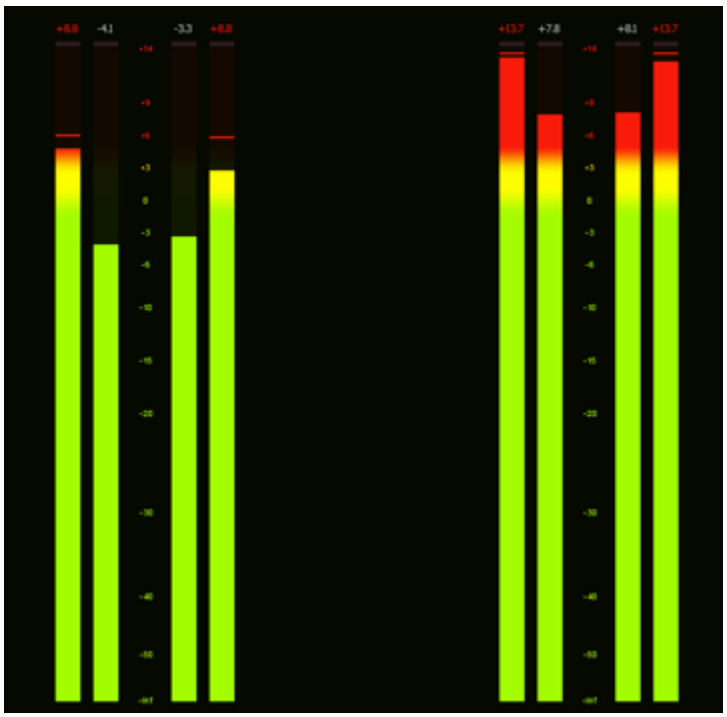
The Meter Bridge features an expanded set of level meters that can be used to independently monitor input and output levels as well as view different calculations of loudness.



Meter Options:

Peak + RMS - juxtaposition of Peak and RMS meters with the option to detect "True Peaks". You can read more about these meters here.

K-System– a method of measuring loudness proposed by mastering engineer Bob Katz incorporating psychoacoustic knowledge. Features Peak and RMS level meters on K-System scales with the option to detect "True Peaks". Read more about K-System Meters here.



BS.1770 Loudness

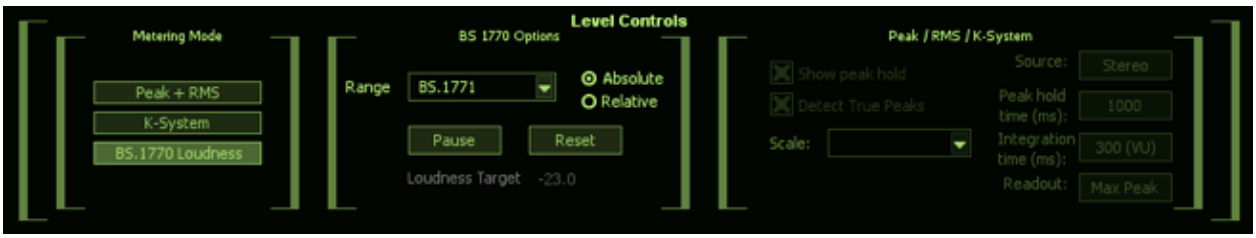
Ozone 5 now features BS.1770 loudness metering compliant with recommendations by the International Telecommunication Union (ITU-R BS.1770-2) and the European Broadcasting Union (EBU R128) that uses an algorithm for determining subjective program loudness and also measures true-peak signal level. These standards are currently being implemented for broadcast audio, but are also very useful for intelligently measuring subjective loudness for all types of audio. BS.1770 Loudness metering generates the following values which can be measured in absolute (LUFS) or relative (LU) values:

Momentary – This measurement is a calculation of loudness over the course of 400ms.

Short-term - This measurement is a calculation of loudness over the course of 3 seconds.

Integrated - This measurement is a calculation of loudness over the course of an indefinite period of time.

Loudness Range - The overall dynamic loudness range of an entire period measured in Loudness Units (LU). 1 LU is equal to 1 dB. You can monitor the overall Loudness Range as it is calculated over time by watching the brackets alongside the Integrated Loudness Meter.



BS.1770 Range Options

Full Range - Full scale (dBFS) range for measuring loudness.

BS1771 - Loudness scale recommended by the ITU that spans from -21 LU to +9 LU (-

45 LUFS to -14.0 LUFS)

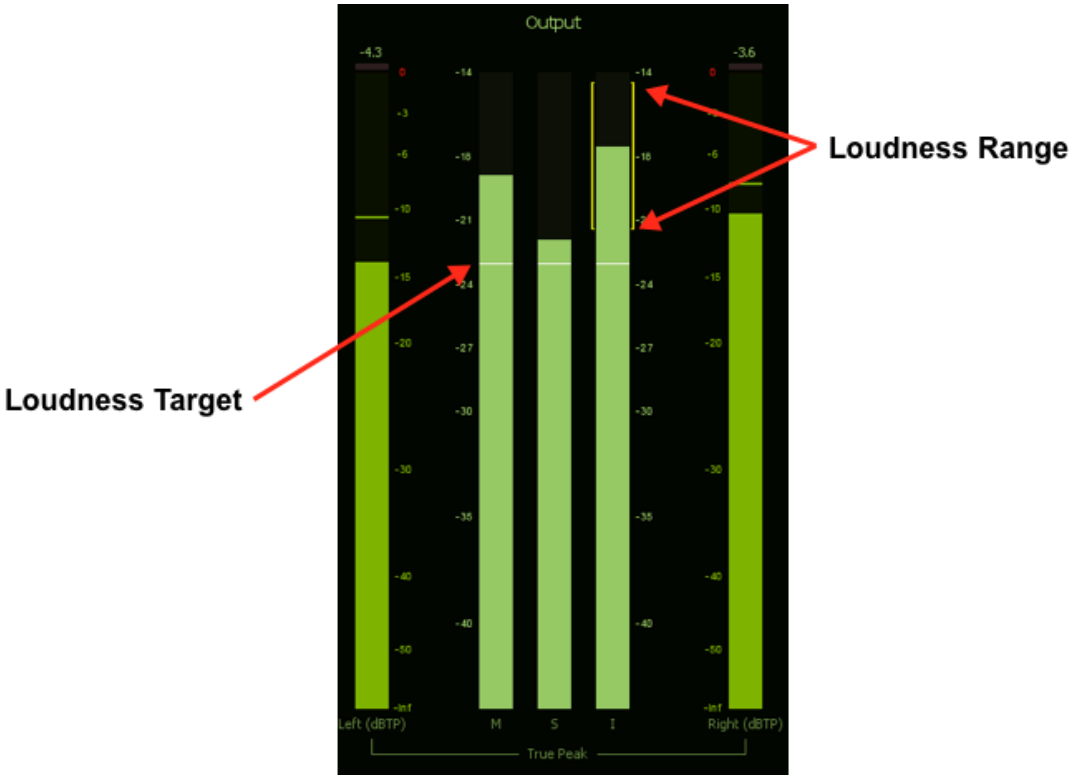
EBU +9 - Loudness scale recommended as a default by the EBU that spans from -18.0 LU to +9.0 LU (-41.0 LUFS to -14.0 LUFS)

EBU +18 - Loudness scale recommended for material with a wide Loudness Range by the EBU that spans from -36.0 LU to +18.0 LU (-59.0 LUFS to -5.0 LUFS)

Absolute vs. Relative Scales

This determines whether loudness is calculated on an absolute scale and measured in Loudness Units Full Scale (LUFS) or on a relative scale determined by the Loudness Target level setting and measured in Loudness Units (LU).

Loudness Target - This setting allows you to adjust the relative scale used when measuring loudness . Set your Loudness Target to your desired output loudness and all measurements will be calculated relative to that value. When measuring loudness on a relative scale a Loudness Unit (LU) value of 1 is equal to 1 dB from the Loudness Target. Your Loudness Target value will be represented by a white indicator line across the loudness meters. The default value (-23LUFS) is recommended by the International Telecommunication Union.

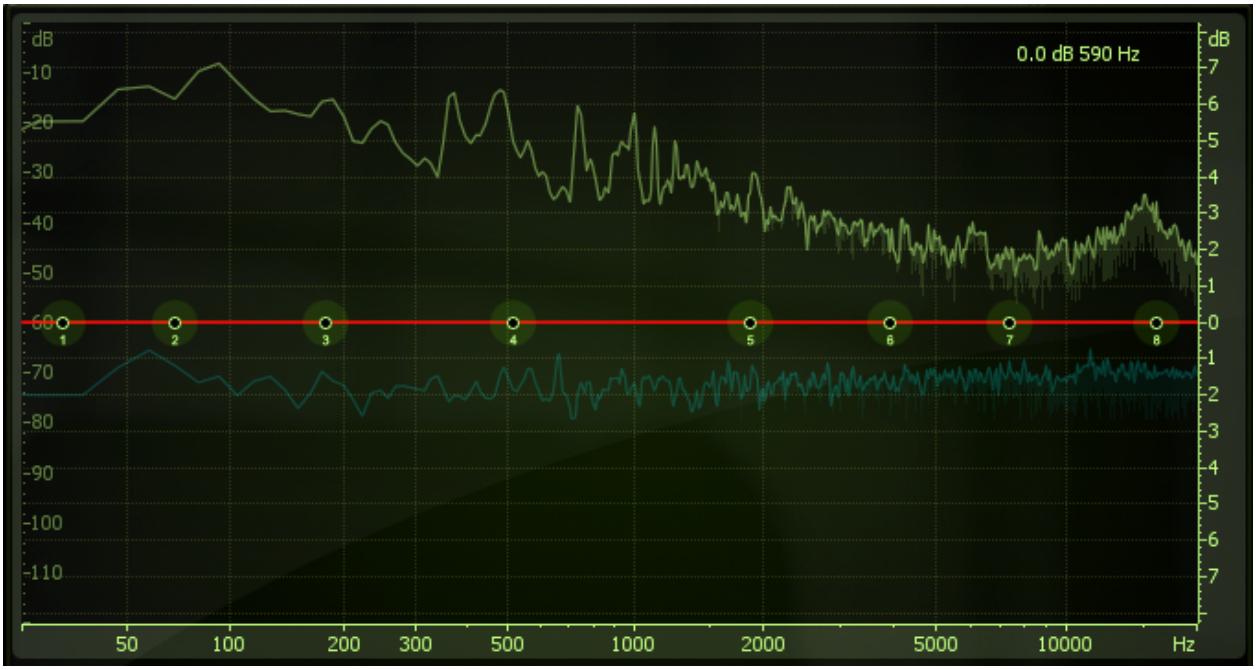


Start/Pause - You may toggle this to start and pause the calculation of loudness at any time without losing the values that have already been measured.

Reset - You may click this to reset all measurements of loudness at anytime.

Mastering Meters
Spectrum Analyzer

The spectrum provides a real time display of the frequencies of the mix. This display helps with EQ'ing and adjusting the band cutoffs for multiband dynamics. Ozone 5 shows two spectra, so users can see both peak and average spectra simultaneously in the display.



Options

You can set options for the spectrum by accessing the Spectrum Options tab or right-clicking (under OS X you can also ctrl-click) the spectrum and selecting "Spectrum Options" from the context menu.

Snapshots

A powerful feature in Ozone is the ability to take up to eight "snapshots" of the spectrum. You can access this feature by clicking on the "Snapshots" button. This reveals a strip of controls related to taking and displaying snapshots. To close the snapshot window click the "Snapshots" button again.

To take a snapshot of the spectrum

Select the Snapshots Tab in the menu under the EQ window. Click on Start Capture. This will take a snapshot of the spectrum, add it to the list on the right, and display it. You can toggle showing or hiding a snapshot by clicking on the corresponding checkbox labeled "Show". Snapshots are remembered when you unload Ozone, so you can access snapshots in later sessions.

To assign a short name to a snapshot

Click the default snapshot name in the list of snapshots. You can now type a label for the snapshot.

To adjust the color of a snapshot

Click the default color of a snapshot to open a color picker menu and select a new color.

To adjust the transparency

Click and drag or double-click and manually enter the default transparency of a snapshot to adjust it.

To delete snapshots

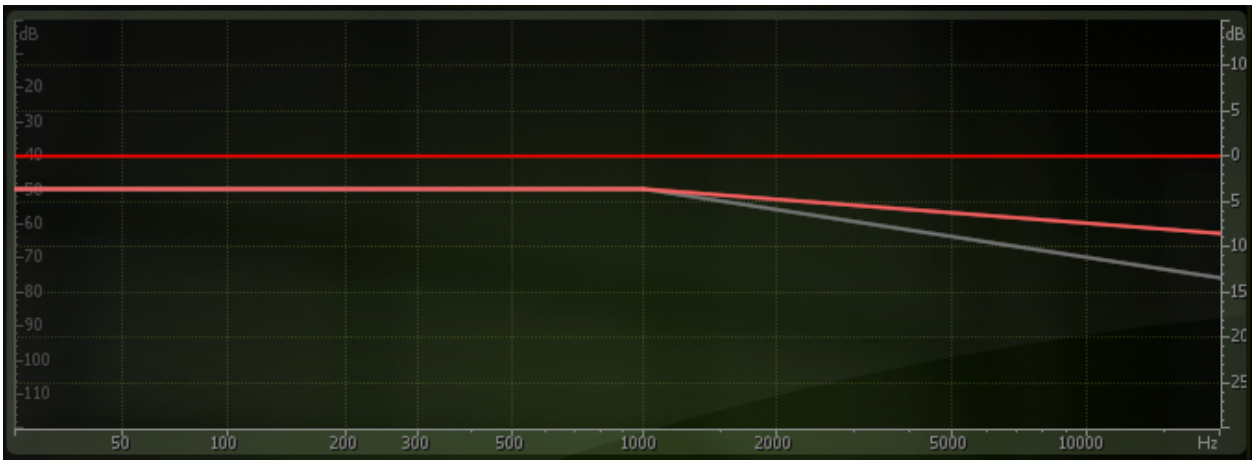
You may delete snapshots by clicking the Delete button on the right of each individual snapshot.

Additional Snapshots

Additional curves that may be displayed are the "6 dB Guide" and "Pink Guide". These snapshots represent the high frequency decay found in many commercial recordings. You can use this as a guide to compare to your own spectrum. In general, many recordings follow the "6 dB" slope, while some newer recordings are tending towards a brighter "Pink Guide" or 3 db slope. To toggle the display of one of these guides, select 6dB or Pink from below the Capture settings.

Note: You can not adjust the overall level or position of these guides, but instead use it as a

representative slope for your spectrum. It is the slope of the spectrum (as opposed to the absolute level of the mix) that defines the tonal balance.



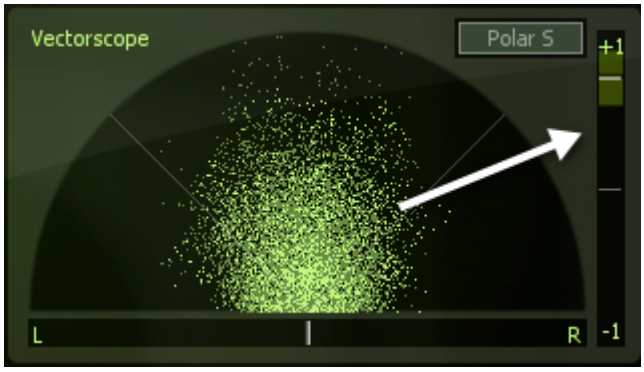
Saving and Loading Snapshot Sets

In Ozone, you can save and load snapshots as files, allowing you to easily access different sets of snapshots. To save a set, click on the Save button, enter a file name and click the Save button. A set may contain between one and eight snapshots. To load snapshot files, click on the Load button and select the snapshot set you wish to load. The selected snapshots will then be loaded into the Snapshot list in Ozone.

Ozone will not overwrite currently loaded snapshots when loading a new snapshot set. If you currently have snapshots loaded into Ozone and are attempting to load a new set, you may need to delete some snapshots currently in Ozone before loading your snapshot set. However, if you have one snapshot currently in Ozone and load a set containing two snapshots, all three will then be loaded into Ozone.

Correlation Meter

The correlation meter indicates the degree of similarity (or correlation) between the left and right channels.



Visual Display

When the audio in the left and right channels is similar, the meter draws towards the top. The extreme case is when the left and right channels are exactly the same, in which case the correlation is +1 and the meter would be positioned all the way at the top.

When the left and right channels are different, the meter draws towards the bottom. The extreme case here would be for the left and right to be exactly out of phase, in which case the correlation is -1 and the meter would be positioned all the way at the bottom.

History

As the correlation meter updates, it "paints" a history to show the correlation of the left and right channels over time. Brighter regions indicate that the correlation meter has spent more time in that area. This provides you with a quick way to visualize the extremes of the phase correlation as well as the most common regions.

In general, most recordings have phase correlations in the 0 to +1 region. A brief readout towards the bottom half of the meter is not necessarily a problem but could represent a possible mono compatibility issue.

Note: As you apply greater multiband stereo widening or reverb width to your audio, the phase correlation will tend to draw more towards the bottom half of the meter, as the left and right channels will become "wider" or less similar.

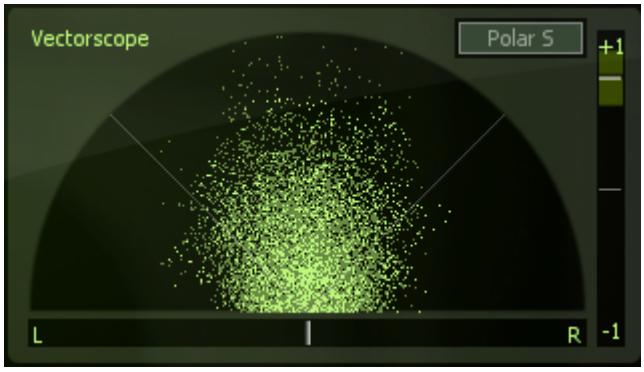
Channel Operations

You can perform a quick check of mono and phase compatibility by clicking on the Channel button below the Vectorscope. This provides a menu that allows you to sum the output of Ozone to mono, invert the polarity of left or right channels, and swap left and right channels.

An additional meter for analyzing stereo spread is the Vectorscope.

Vectorscope

The Vectorscope provides a view of the stereo image of the signal. You can check mixes for stereo separation and use Ozone controls (stereo widening and room width) to provide more or less separation. Ozone 5 adds Polar Sample and Polar Level modes for more in depth analysis.



Display Types

You may toggle through the following different display options for the vectorscopeby clicking on the button in the top right.

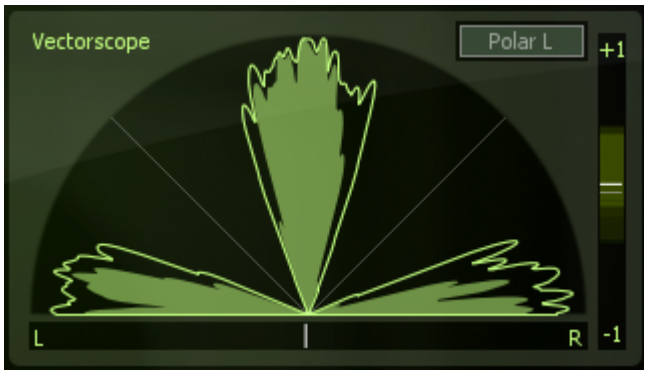
Polar Sample Vectorscope

The Polar Sample Vectorscope plots dots per sample, but uses a polar coordinate display that is more useful in highlighting the stereo image of the incoming signal. Patterns that appear within the 45-degree safe lines represent in phase signals while patterns outside these lines represent out of phase audio.

The history of the Polar Sample Vectorscope also fades out slowly. The infinite history is shown as the faintest shade of green while the last few seconds are displayed as slowly fading data points. You can reset the display by clicking on the meter.

Polar Level Vectorscope

The stereo energy of a recording is clearly represented by the Polar Level Vectorscope which plots rays on a polar coordinate display that represent sample averages. The length of the rays represents amplitude while the angle of the rays represents their position in the stereo image. Rays within the 45-degree safe lines represent in phase audio while anything beyond these lines represents audio that is out of phase.



History is represented on the Polar Level Vectorscope with the shrinking of the plotted rays slowly over time. The rays shrink towards the center of the vectorscope leaving the outer

portion of the display for real-time analysis.

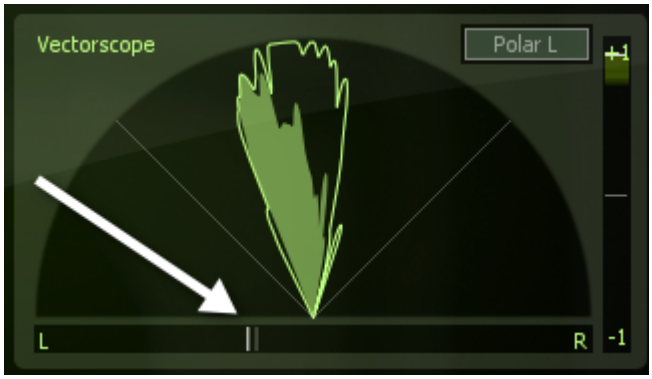
Lissajous Vectorscope

Like the Polar Sample vectorscope, the Lissajous Vectorscope plots per sample dots on a traditional oscilloscope display. Typically, stereo recordings produce a random pattern on a Lissajous Vectorscope that is taller than it is wide. Vertical patterns mean left and right channels are similar (approaching mono, which is a vertical line). Horizontal patterns mean the two channels are very different, which could result in mono compatibility problems.

The history of the Lissajous Vectorscope fades out slowly instead of remaining forever. The infinite history is shown as the faintest shade of green while the last few seconds are displayed as slowly fading data points. You can reset the display by clicking on the meter.

Balance Meter

Below the vectorscope is a meter that illustrates the overall balance between the left and right channels of your mix. A lighter bar illustrates the balance in real time while a slower dimmer bar follows the real time calculation to be more easily readable.



Meter Tabs

Channel Operations

You can perform a quick check of mono and phase compatibility by clicking on the Channel button below the vectorscope. This provides a menu that allows you to sum the output of Ozone to mono, swap left and right channels, or invert the polarity of left or right channels.

Phase

You can enable phase rotation on the audio signal by clicking on the Phase button below the vectorscope. This feature can help reduce asymmetric waveforms that are found in dialog and voice by rotating the phase up to 90 degrees. Making the waveform more symmetrical allows the voice to ride perceivably higher in the mix. This is useful in broadcast radio and dialog mixing. When wishing to correct an asymmetric waveform, simply adjust the Phase Rotation Amount until you get the lowest consistent peak levels. The Phase Rotation Amount is set too high if the peak levels begin to increase again.

Offset/Delay

You may affect the offset or delay of individual bands by clicking on the Offset button below the vectorscope. This allows you to offset one channel (left or right) by a specific amount of milliseconds. This is not designed to be used as a delay effect, but instead as a tool that can balance the stereo image by providing a corrective delay to one channel. This is useful, for example, in a situation where a mix was recorded with stereo microphones that were slightly off axis. By default the band delays are grouped to provide the same delay offset across all bands, but you can ungroup them and adjust the imaging for individual bands.

Other Options

You can click on the phase meter to reset the peak hold display.

You can turn the peak hold display off in the Meter Options Screen.

Clipping

The Vectorscope will draw any clipped samples in red.

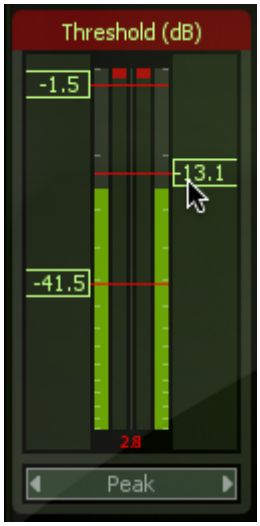
An additional meter for analyzing stereo spread is the Correlation Meter.

Dynamics Meters

Ozone provides three types of meters for viewing the dynamics of a mix. You can set options for these meters by right clicking on any of the dynamics meters, or selecting the Dynamics Options or the Maximizer Options in the Options panel.

Threshold Control Meters

Both the Dynamics and Maximizer modules feature Threshold Control Meters that allow you to adjust the thresholds of the gate, compressor, and limiter in the Dynamics module and the threshold and the margin of the Maximizer, while monitoring how the signal is being affected in real time.

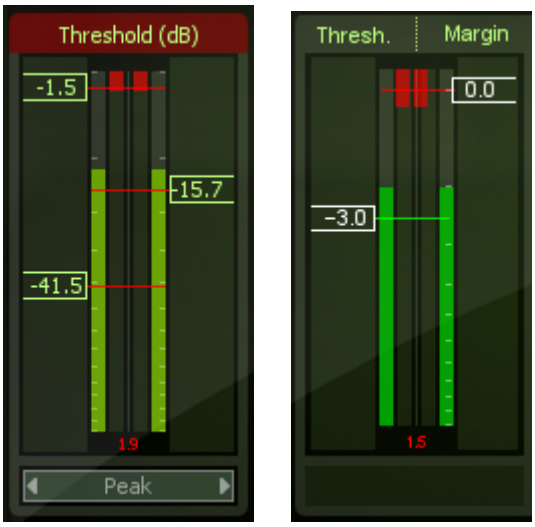


The Threshold Control can display gain reduction as it is taking place with level meters. To enable the Gain Reduction level meters, right- (or control-) click on the threshold control's meter window and select Dynamics or Maximizer Options. From the Dynamics or Maximizer options page select Gain Reduction under the Threshold Meter drop-down menu. Two meters display the levels of the incoming signal and as gain reduction begins to take place, a gain reduction meter appears in red between the two level bars. The Threshold meter also displays the amount of gain reduction in real-time with a dB readout at the bottom.

The Threshold Control can also display a Histogram, a history of level over time. To enable the histogram, right- (or control-) click on the threshold control's meter window and select Dynamics or Maximizer Options. From the Dynamics or Maximizer options page select Histogram under the Threshold Meter drop-down menu. This allows you visualize the overall "level content" of the audio by providing a running display of the history of levels in the audio.

Reduction Meters

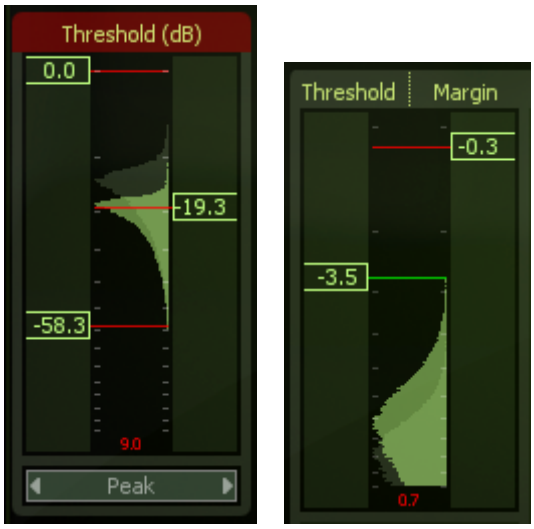
When working in the multiband dynamics and loudness maximizer modules, the reduction meter provides you with a readout of how much the dynamics processing is changing the level of the signal. You can set this to display the amount of compression and limiting, and/or the amount of gating by right-clicking (under OS X you can also ctrl-click) on the meter.



In the screen above, on the left the compressor at that point in time is compressing or reducing the level of the input signal by 1.9 dB and on the right the Maximizer at that point in time is limiting or reducing the level of the input signal by 1.5 dB.

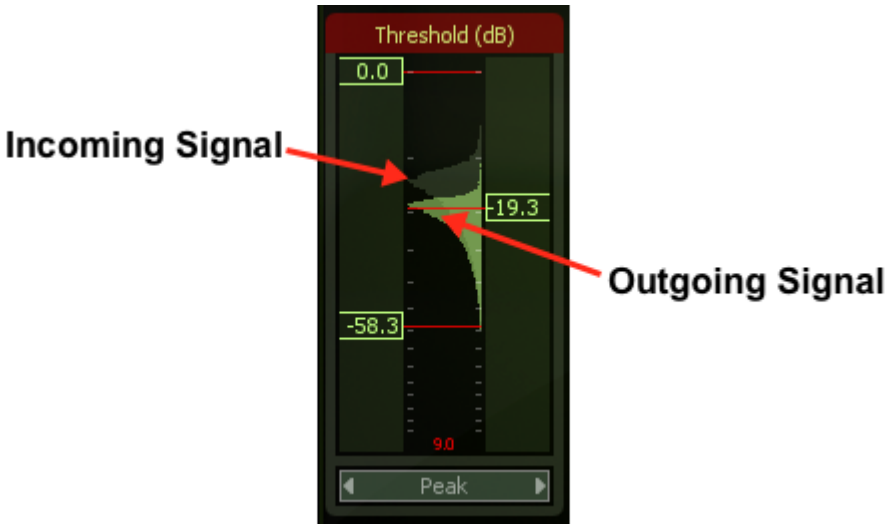
Level Histograms

Level histograms can be turned on in the Dynamics and Maximizer modules to provide a view of the audio level as a function of time in the Threshold Controls.



As Ozone processes audio, it calculates the level and displays it on the level histogram. Unlike a standard level meter, the level histogram provides a view of the history of the level over time. The height of the histogram represents the high and low levels of the audio, while the width of the bar indicates the most frequent levels.

For additional visual feedback, an additional histogram is displayed for regions that are being limited by the Loudness Maximizer or the Multiband Dynamics.



Dynamic Curve Meter

This meter shows the input signal (x axis) plotted against the output (processed) signal (y axis). More horizontal compression curves means the signal is being flattened (compressed) more.

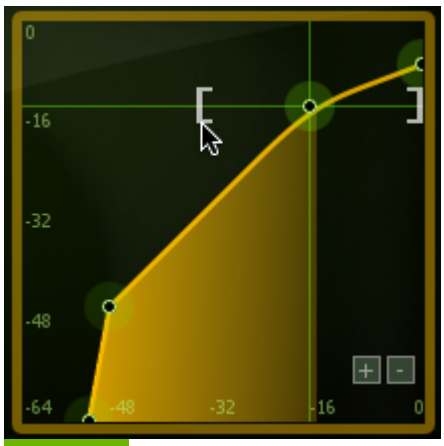
By default, the range of the meter is from 0 dB to -64 dB. You can adjust the range by pressing the (+) or (-) buttons in the graph to see a zoomed-in or zoomed-out view of the curve.

Note: If you zoom out completely so the range is 0 dB to -128 dB, you'll be able to set compressor/limiter/expander thresholds down to -130 dB. When you zoom in again, the thresholds will keep their values, even though the sliders will adjust to allow finer control of thresholds between 0 dB and -80 dB.

You can also set individual options for this meter by right-clicking (under OS X you can also ctrl-click) on it to bring up the dynamics meter options screen.

Nodes:

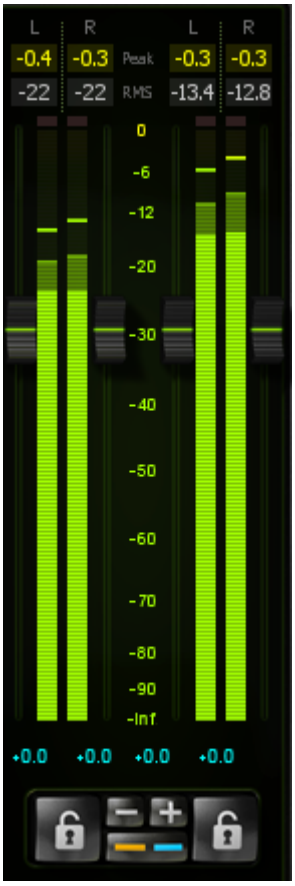
The meter features individual nodes for the limiter, compressor, and expander as well as nodes surrounding these that represent input and output. These nodes are linked to the Threshold and Ratio controls, and can be used to adjust the curve in a visual way, rather than setting them with the standard controls.



[ADV] **Advanced Nodes:**
You may variably adjust the knee of each stage of the dynamics process from hard to soft with horizontal handles that appear when a node is selected. (Ozone 5 Advanced)

Input and Output Meters

Ozone level meters display the input and output level for the left and right channels. New for Ozone 5 we added support for BS.1770-2 and EBU128 loudness metering. This very powerful approach to loudness metering and monitoring allows you to analyze the apparent loudness of your mix.

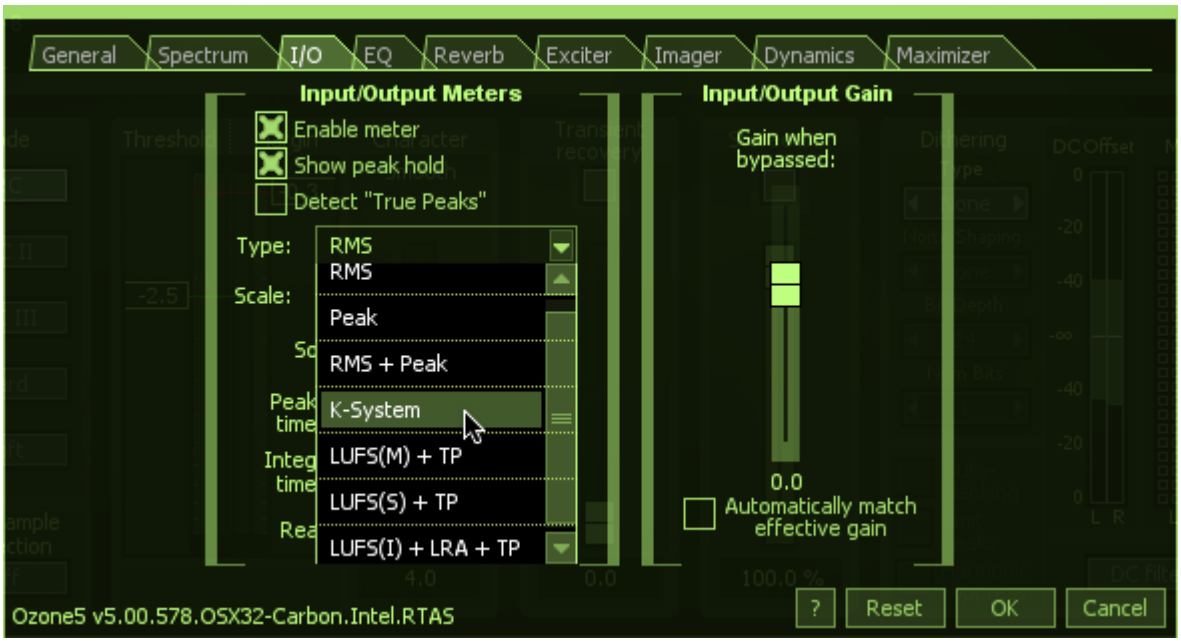


Note: You can set these options by opening the Options Dialog and selecting the I/O Options tab. The available options for calibrating Ozone's I/O meters are listed below.

RMS: RMS (Root Mean Square) is a software-based implementation of an analog style level meter. Using different integration times, you can model popular VU or PPM meters. The RMS meter displays the average level calculated over a short window of time. The RMS meter readout will typically be lower than an equivalent PPM meter (Digital/Analog), since it is averaging peaks into the overall loudness.

Peak: The Peak meter is a fast meter that measures instantaneous maximum sample value OR peak analog waveform values, depending on the "detect inter-sample peaks" checkbox. If you are tracking the peaks for possible clipping the Peak meter is appropriate.

RMS + Peak: This is a combined RMS and Peak meter. This meter displays a lower bright bar representing the average level (RMS) and a higher dimmer bar representing peak level. There is also a moving line above the bar representing the most recent peak level or peak hold.



K-System metering

Ozone 5 supports Bob Katz's K-System metering with simultaneous peak and RMS displays. There are three different K-System meter scales, with 0 dB at either 20, 14, or 12 dB below full scale, for typical headroom requirements. The three K-System meter scales are named K-20, K-14, and K-12. These meters represent three switchable scales: K-20 with 20 dB headroom above 0 dB, K-14 with 14 dB headroom, and K-12 with 12 dB headroom. The dual-characteristic meters have a bar representing the average level and a moving line or dot above the bar representing the most recent highest instantaneous (1 sample) peak level.

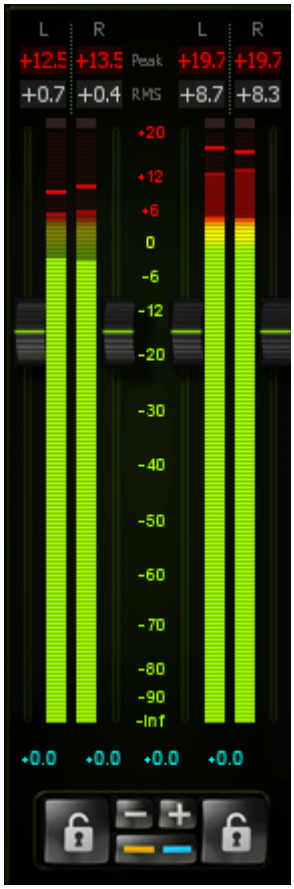
fig 1. 

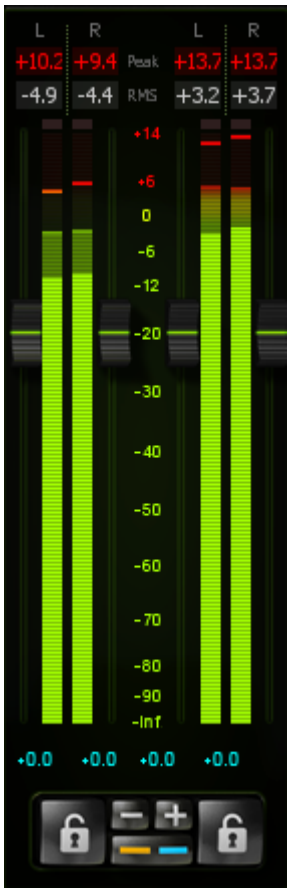
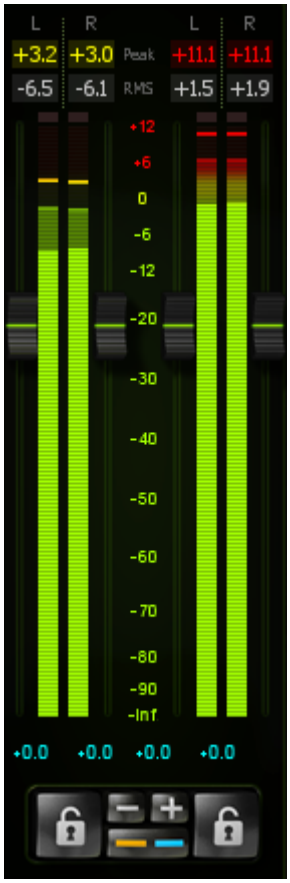
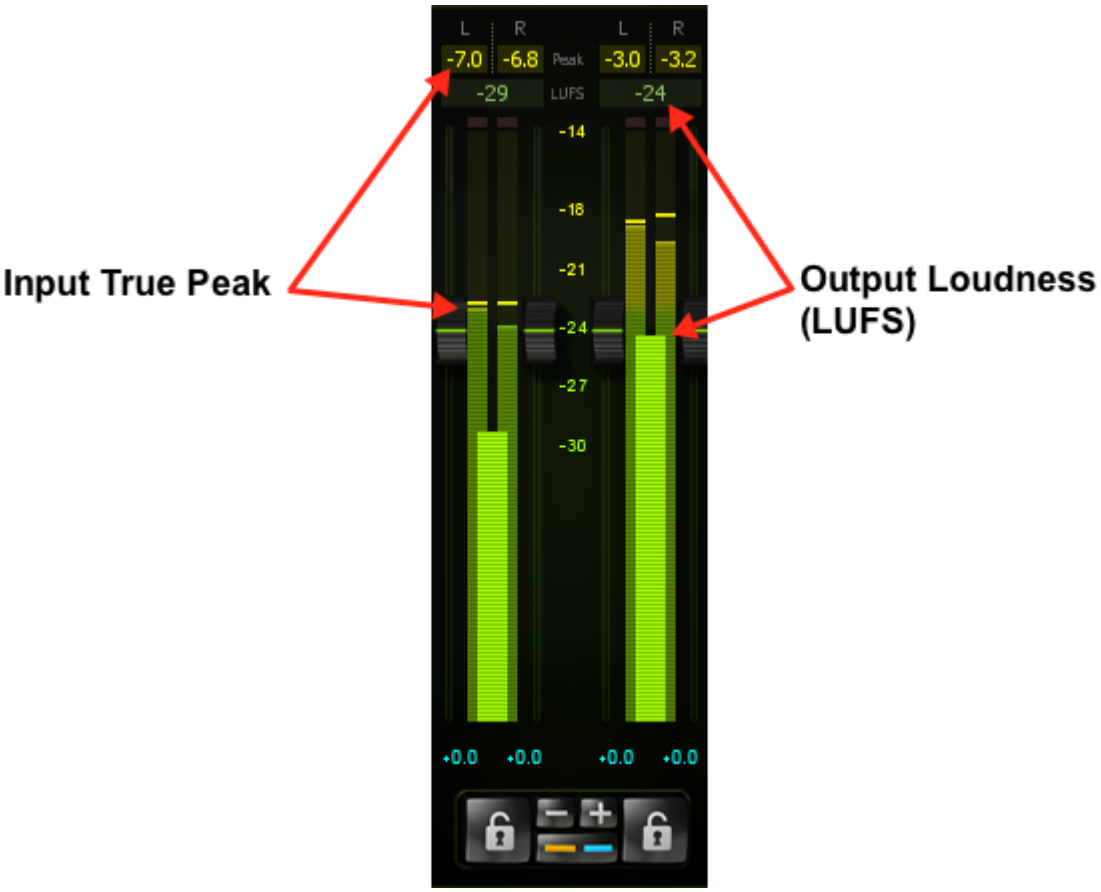
fig 2. 

fig 3. 

1. The K-20 meter is intended for wide dynamic range material, e.g., large theatre mixes, "daring home theatre" mixes, audiophile music, classical (symphonic) music, "audiophile" pop music mixed in 5.1 surround, and so on. Pop engineers are encouraged to use K-20 when the music has useful dynamic range.
2. The K-14 meter is for the vast majority of moderately-compressed high-fidelity productions intended for home listening. If making "typical" pop or rock music, or audio for video, then probably choose K-14.
3. The K-12 meter is for productions to be dedicated for broadcast. Broadcast recording engineers may certainly choose K-14 if they feel it fits their program material.

BS.1770 Loudness Metering

Ozone 5 now features LUFS loudness metering derived from recommendations by the International Telecommunication Union (ITU-R BS.1770-2) and the European Broadcasting Union (EBU R128) that uses an algorithm for determining subjective program loudness and true-peak signal level. These standards are currently being implemented for broadcast audio, but are also very useful for intelligently measuring subjective loudness for all types of audio.



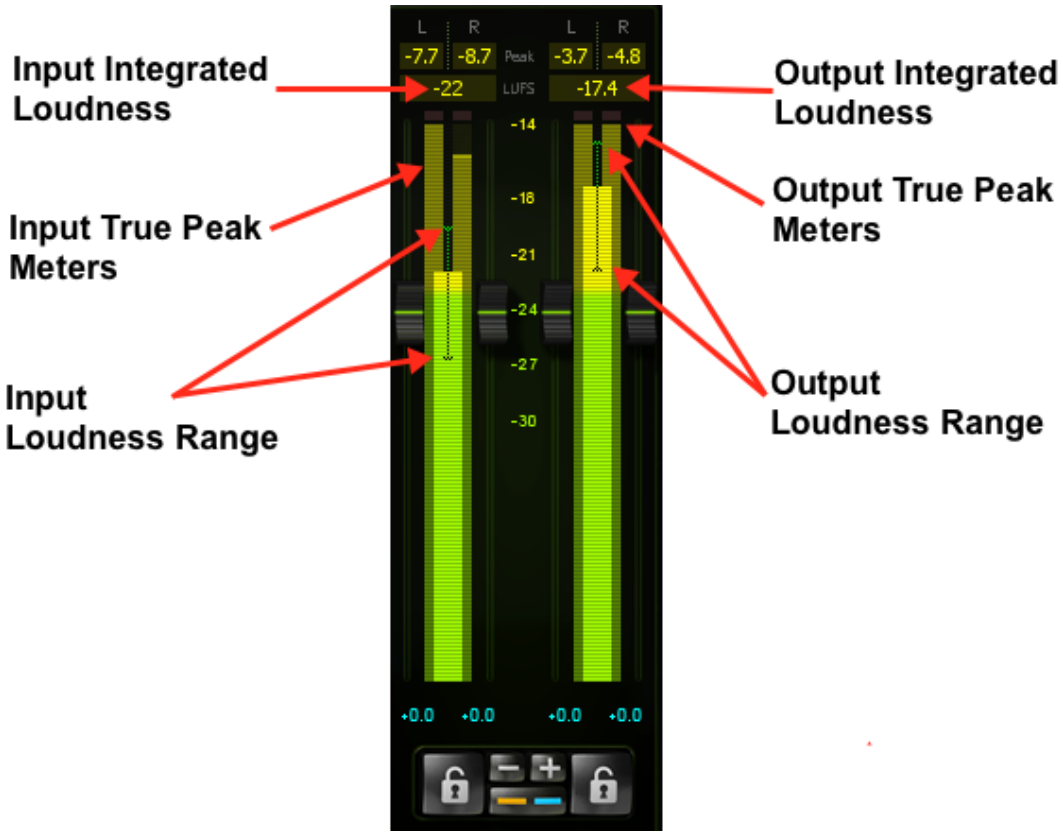
There are three selectable modes of BS.1770 Loudness metering in the Input and Output meters:

LUFS(m) + TP – Loudness measurement which calculates loudness over the course of a momentary interval of 400ms.

LUFS(s) + TP - Loudness measurement which calculates loudness over the course of a short interval of 3 seconds.

LUFS(i) + TP - Loudness measurement which calculates loudness over the course of an entire period and generates an overall Loudness Range represented by brackets imposed on the LUFS meters.

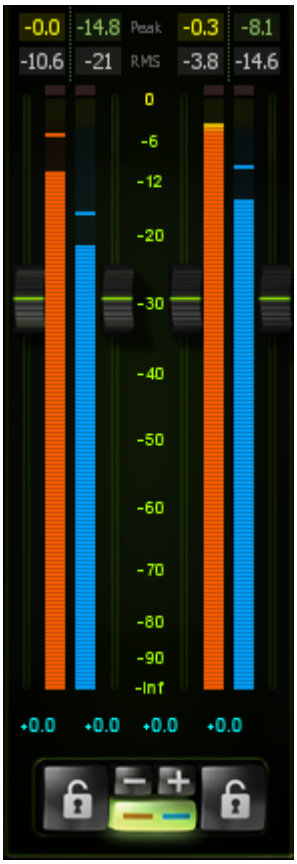
Note: All BS.1770 metering settings feature Left and Right True Peak meters represented by dimmer meters while a single solid meter in the forefront represents LUFS.



Loudness Range - The overall dynamic loudness range of an entire period measured. You can monitor the overall Loudness Range as it is calculated over time by watching the brackets imposed on the Integrated Loudness Meter (LUFS(i) + TP mode only).

Setting the Source of the Meters - Mid/Side metering option

By default, the I/O meters will display the Stereo mix of your audio. However, when working with Mid/Side processing, it is often very helpful to have a clear meter indication of the overall Mid and Side levels individually. The small orange and blue button below the meter allows you to choose the source of the input/output meters. When engaged the meters will display the Mid/Side levels and when off (default) the meters will display Stereo (left/right) levels. You can also change the source of the meters from the Source button inside of the I/O Options menu.



When the I/O meters are in Mid/Side mode, they will no longer display your signal in terms of Stereo Left and Right. Instead, on the left side of the meter will be the level of the entire Mid signal, and on the right will be the overall level of the side signal. The Left and Right Gain sliders will still control the Left and right Gain of your signal however. The Mid/Side meters will still adhere to the same Type and Scale settings defined in the I/O options menu.

Setting the Scale of the Meters

By default, the range of the meters is from 0 dB to -96 dB. You can further customize your metering by adjusting the scale of the input and output meters. Clicking the (+) sign below the meters will increase the zoom or resolution of the metering scale, and clicking the (-) sign will decrease or zoom out the resolution of the metering scale.

You can also adjust the scale by pressing down the Ctrl key under Windows or the Command key under OS X and clicking with the left mouse button to expand the range or the right button to decrease the range.

Scale Options

You can set the following meter scales in the I/O tab of the Options Dialog, which you can also access by right-clicking (under OS X you can also ctrl-click) on the level meters:

dB (Linear) - decibel scale presented linearly from -60 dB to 0 by default

dB (Non-linear) - full decibel scale (dBfs) presented non-linearly

BS.1771 - Loudness scale recommended by the ITU that spans from -45 LUFS to -14.0 LUFS

EBU +9 - Loudness scale recommended as a default by the EBU that spans from -41.0 LUFS to -14.0 LUFS

EBU +18 - Loudness scale recommended for material with a wide Loudness Range by the EBU that spans from -59.0 LUFS to -5.0 LUFS

Note: LUFS is Loudness Units Full Scale and 1 LUFS = 1 dB.

Peaks

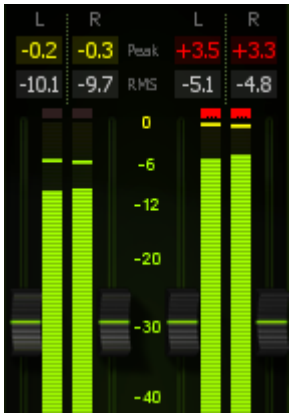
By default, the meters will hold peaks. You can configure this in the I/O tab of the Options Dialog, which you can also access by right-clicking (under OS X you can also ctrl-click) on the level meters.

To reset a peak that is holding, click anywhere on the meter.

Clipping

Above the meter is a red LED that serves as a clipping indicator. If the level exceeds 0 dB at any point, this LED will light up and remain lit until you double click anywhere on the LED itself. The clipping indicator will also show the number of samples over 0 dB you have clipped. (Once you have clipped over 99 samples the indicator will show three periods...)

By default the Input/Output meters will only indicate clipping which occurs within the digital domain. To accurately measure the signal that will result from digital to analog conversion select 'Detect "True Peaks"' in the I/O Options tab.

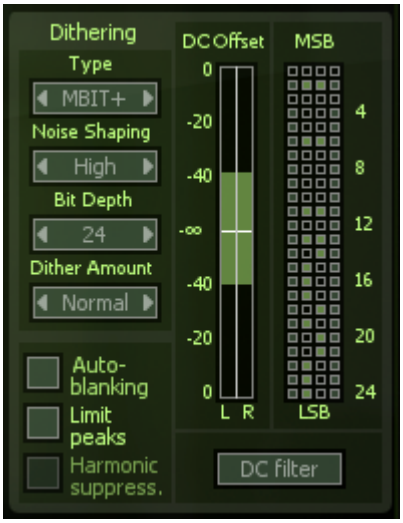


Options

You can set the I/O meter options by opening the Options Dialog and selecting the I/O Options tab. You can also right-click (under OS X you can also ctrl-click) the I/O meters to bring up these options directly.

Dithering Meters

Included in the dithering section are two meters. A DC offset meter lets you view the amount of DC reduction that is being performed on the program material, while a bit meter provides you a view of the bit activity of the digital signal.



DC Offset Meter

When the DC Offset Filter is On, the DC Offset meter shows the level of the DC (in dB) that is being removed. You can right click on the meter to set options including turning it on or off, and enabling the peak hold or not.

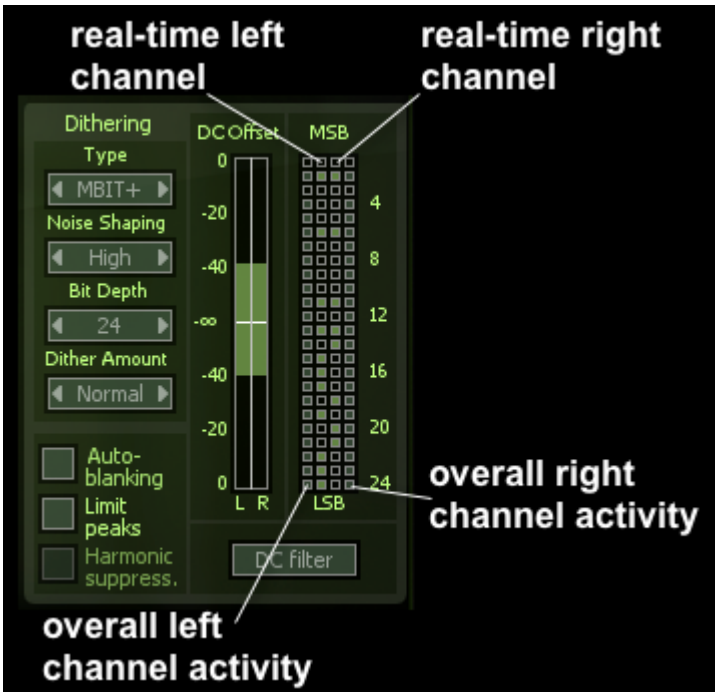
Like other meters in Ozone, left-clicking on the DC offset meter will reset the peak hold and clear its history.

Bit Meter

This can be an invaluable resource for monitoring the digital activity of your program material, including viewing whether the full range of bits (dynamic range) is being used, the output word length, faulty A/D converters, sub-par plugin processing (detecting a plugin that's only processing at 16 bit, using fixed integer math, etc.), etc.

This meter monitors the state of bits in a digital signal.

The inner two columns show the real time activity of the bits of audio, for the left and right channels. The outer two columns remember the real time activity in a sort of "peak hold" way. If the inner columns toggle a bit (i.e. "light up") the outer columns will show that bit as being used.



This is not a level meter. Instead, it shows which bits are being used. If a bit is used (goes from 1 to 0 or vice versa) the position for that bit is lit.

The main use of the bit meter is to look for problems or discontinuities in the digital signal. Some examples of problems are shown below:

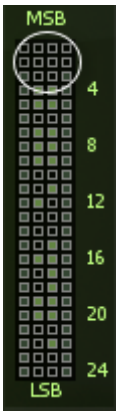
fig 1 

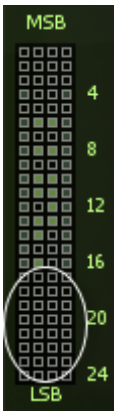
fig 2 

fig 3

1. Headroom. In the first meter above (fig 1), upper bits aren't being used. You may have a 24 bit audio file, but aren't using all of the bits.
2. In a more extreme case, you are only using 16 bits as shown by the second meter above (fig 2). Now if you're dithering to 16 bits, this is what you want to see. But if you're not dithering, this would suggest there is a problem somewhere. Either an A/D converter that is only putting out 16 bits, a plug-in that's truncating your signal down to 16 bits, etc.
3. Stuck Bit. In the final case (fig 3), one bit in the middle of the signal isn't being exercised. Again, it could be a faulty A/D or bug with a software plug-in.

In general, you want to see activity on each of the bits (except the top one - see below for explanation). Meaning that over a period of a few seconds each of the bits in the outside

columns should be lit. You should also click on the meter periodically to reset the peak hold of the outside columns, as something like DC offset would toggle a lower bit once (lighting the outside column) but would never toggle it after that since the bit is being held.

Of course, if you're dithering down, you only want to see 16, 12, or 8 bits lit (corresponding to the output bit depth of the dither)

Why the top bit will never light up

When samples are stored as a binary number, negative samples are specially encoded. Since the binary representation of negative numbers is not intuitive, Ozone takes the absolute value of each sample before plotting it on the bit meter. Since the most significant bit is only set when a sample is negative, this bit will never light up. We simply included the top bit as placeholder for completeness.

Preset System
Preset Manager

Ozone 5 includes presets that are designed to help with specific problems areas or common situations like Drum treatments, Vocal treatments, or General Purpose Mastering for CD production.

To access the Preset Manager, click the Preset button on the Ozone faceplate or press Ctrl+P.

Key Features

- Easily backup and transfer preset files
- Store preset files in folders for easy access and management
- Share Ozone presets across multiple host applications and operating systems
- Sort presets based on name, date modified or date last used
- Update presets with one click
- Add comments to presets for easy reference.

Ozone 5 Preset Manager
Sort by: name last modified last used
<Working Settings>
<Default>
General Purpose Mastering
3-Band Master - Gentle Tube
3-Band Master - Instrumental with Slow Dynamics
3-Band Master - Reduce Lows and Highs
3-Band Master - Slight Gating
3-Band Master - Subtle Dynamics
*3-Band Master - Tighten Low End
3-Band Master - Warm Mids
4-Band Master - Excitation And Widening
4-Band Master - Heavy Bass and Ambience
4-Band Master - Midrange Detail
4-Band Master - Midrange Dynamics
4-Band Master - Punchy Dynamics
4-Band Master - Strong Midrange Tape Saturation
4-Band Master - Upward Compression
4-Band Master - Upward Expansion
4-Band Master - Warm Mids
CD Master - Exciter And Widener
CD Master
EQ 1 Amount 119.0
Maximizer Amount 100.0
Exciter Amount 100.0
Dynamics Amount 100.0
Add
Remove
Update
Compare
New Folder
Show at startup
Heavy bass compression and tightened low end with band delay
Change folder...
More presets...
Dock
?
Close

Folders

Ozone 5 presets have been sorted and organized into separate categories or preset folders.

This makes finding a good starting point for your mastering session quicker and easier. The default preset folders that are included with Ozone 5 are listed below.

- General Purpose Mastering: Presets designed as a starting point for a wide range of mastering applications
- Genre-Specific Mastering: Presets designed to be useful starting points for specific genres of music
- Instruments and Busses: Presets useful for processing individual instruments or groups of instruments
- Post and Broadcast: Presets designed to help with various post production and broadcast related applications
- Special Effects: Presets using Ozone's modules to create audio effects
- Utility: Equalizer, widening, enhancement, soundstage and dynamics presets for various applications

Using Amount Controls

Unlike the macro faders used by Ozone 4's preset manager, Ozone 5 displays the Amount Controls for each module used by a particular preset allowing you to adjust them conveniently from the Preset Manager window. Remember that the Amount Controls are configurable and may affect different parameters of the modules in different presets.

Dock and Undock

Clicking the Undock button at the bottom of the Preset Manager opens a floating window. This lets you work with the Preset Manager while still being able to view the edit windows for the individual Ozone modules. To have the Preset Manager return to the Ozone interface click the Dock button.

Selecting Presets

To access the Preset Manager, click the Preset button on the Ozone faceplate or press Ctrl+P.

Loading Presets in Ozone

You can select and audition any preset by simply clicking on the name in the list. This will activate selected Ozone modules and you will hear the effect of the preset when you playback your audio. You can easily compare several different presets just by picking a different name on the list.

Working with Presets in Ozone

Once you have selected a preset from the list, you may choose to change the original settings within a specific module. When you change any of the original settings within a preset you will see an asterisk* added to the beginning of the preset's name. This means that the preset has been altered. If you want to keep these settings you need to Add a new preset or Update the existing preset.

Working Settings

If you modify a preset's settings, then these modified settings become your "Working Settings". Your Working Settings will always be at the top of the preset list within the preset manager. This allows you to freely preview and compare different preset options. When you are done, you can return to your Working Settings by selecting the item at the top of the Preset Manager labeled <Working Settings>. To select a preset and have it replace your Working Settings, just select the name of the new preset and click the OK button.

Sort by Name, Last Used, or Last Modified

As a convenience you can sort presets by name, by the time/date last used, or the time/date last modified.

Last Used

A preset is considered "used" when you select it and you close the preset system dialog. The last used time/date stamp is not updated when you are selecting and auditioning presets from the list.

Last Modified

A preset is considered "modified" when you either create one or you make changes to one and update it with the Update button.

Adding and Removing Presets

Add: Clicking this button adds the current Ozone settings as a new preset. You can type a name and optionally add comments for the preset. Note that a few keys such as * or / cannot be used as preset names. If you try to type these characters in the name they will be ignored.

Note: This is because presets are stored as xml files (for easy backup and transferring). Their file names are the same as the name you give the preset (for easy reference) and therefore characters that are not allowed in Windows file names are not allowed in preset names.

Remove: To permanently delete a preset, select the preset from the list and click the Remove button.

Update: When you click the Update button your current settings are assigned to the selected preset (highlighted). This is useful of course for selecting a preset, tweaking it, then coming back to the preset system and clicking Update to save your changes to the existing preset.

Compare: The Compare button is a great way to quickly hear the difference between the default settings of the most recent preset that you've selected, and the result of any changes that you have made to this preset (Working Settings). This lets you start your mastering session based on one of Ozone's default presets and then continue to tweak the settings, always comparing to where you started.

New Folder: The New Folder option allows you to easily add custom named folders to the Ozone preset manager.

Show at Startup: This allows you to set whether or not the preset manager will open automatically when starting Ozone.

Cancel: The Cancel button simply closes the preset system dialog and reverts the settings back to the previous Working Settings, which would be either the settings when you entered the preset system or the settings of the last preset you created or updated while the preset system was open.

Note: You cannot "Cancel" an update of a preset. That is, adding, removing, and updating presets are done "in place" and are not reverted when you Cancel the preset system dialog.

Close: Closes the preset system, but unlike the Cancel button, clicking the OK button loads the last preset you selected from the preset list.

Renaming Presets: You can double click on the name of a preset to enter the "edit" mode and then type a new name for that preset.

Ozone 5 Preset Manager
Sort by: name last modified last used
Piano - Subtle
Saxophone Stack
Strings - Add Warmth
Synth - Exciter, Limiter, Widening
Synth - Louder with Plate Reverb
Upright Bass - Agressive
Vocal Compressor - 3-Band
Vocal Compressor - 4-Band
Vocals - EQ, Dynamics, Reverb, Tape Saturation
Woodwind Section
New Folder
New Preset
Post and Broadcast
Background - Drop Low End
Background - High Frequency Clamp
Dialog - Center and Accentuate
Dialog - Center
Foley - Add Presence, Control Low End
Foley - Lower Chatter
Foley - Narrow Image
FX Track - Excite and Revive Old Clips
EQ 1 Amount 100.0
Maximizer Amount 100.0
Exciter Amount 100.0
Dynamics Amount 100.0
Add
Remove
Update
Compare
New Folder
Show at startup
[Click here to enter a comment]
Change folder...
More presets...
Dock
?
Close

Changing Where Presets Are Stored

Change Folder

You don't need to store all of your presets in the default folder(s). You can create custom folders of presets for different projects, archive presets, etc. To change the folder that Ozone looks to for presets, click the Change Folder button and browse to the folder that contains the presets you want to use.

Backing up Presets

Backing up presets is as simple as copying files. Just browse to the location of your preset files. The XML files in this folder are your presets with one XML file for each preset. You can reference the preset files by their file names because the name you give the preset in Ozone becomes the name of the XML file.

Windows Users

C:\Documents and Settings\<your username>\My Documents\iZotope\Ozone 5\Global Presets

Mac Users

<username>\Documents\iZotope\Ozone 5\Global Presets

Module Preset System

Ozone 5 includes a new module preset management system. You can now load and save preset settings for individual modules allowing you to mix and match settings for various modules. The module preset system works in a similar way to the global preset system but with a simplified interface more conducive to working with individual modules.

Key Features

- Easily backup and transfer preset files for individual modules
- Load settings for a module without affecting the settings of other modules
- Save settings from global presets for an individual module
- Save settings from Ozone 5 Advanced for use in component plug-ins

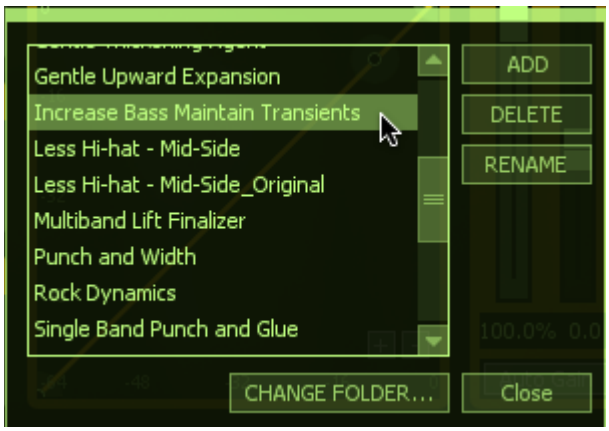
Opening the Module Preset System

While working in any module within Ozone, click the button to the right of the module's active button to open the Module Preset System menu.

[ADV] When working in Ozone Advanced, the module preset system may be launched by pressing the Presets button in the bottom right.

Loading Module Presets

You may apply the settings of any of the module presets by clicking on them in the Module Preset menu.



Saving Module Presets

After applying your own settings to a module in Ozone or after altering an included preset,

you may save the settings as a custom preset by opening the Module Preset menu and clicking the Add button. You will then be prompted to name the new preset. Additionally, you may save the settings of an individual module from a global preset into a new module preset.

Deleting Module Presets

You may delete any module preset by opening the Module Preset menu, highlighting the preset, and clicking the Delete button.

Changing the Module Presets Folder

Like the Global Preset System, the Module Preset system allows you to specify where module presets are stored on your hard disk. Simply open the Module Preset menu and click the Change Folder button. A file window will open in which you may specify the location of module preset files. By default, each module's presets are stored in a folder located at the following locations:

Windows Users

C:\Documents and Settings\<your username>\My Documents\iZotope\Ozone 5\

Mac Users

<username>\Documents\iZotope\Ozone 5\

Migrating Presets from Ozone 4

We have done our best to ensure all presets from Ozone 4 open in Ozone 5 sounding as good (or better!) than they did previously. However, some modules have been completely overhauled with new algorithms and processing and may sound different when loading your Ozone 4 Presets.

Equalizer

All Equalizer settings from Ozone 4 will carry over to Ozone 5. If you have any snapshots saved from Ozone 4 however, you will need to recapture them in Ozone 5 as we have updated how this process works. And while in the EQ, be sure to try out the new filter curves. You may find that you are now able to create complex curves with fewer nodes. If you are using Ozone 5 Advanced, try experimenting with Mixed Phase mode using linear phase filters for precise cuts and minimum phase filters for gentle sculpting.

Reverb

We have completely reworked the reverb module in Ozone 5. We have mapped settings from Ozone 4 intelligently to Ozone 5, so your presets should open with a similar sounding reverb, however, be sure to take the time to tweak settings to take full advantage of the improved module. Adjusting the Wet and Dry controls may be all you need to get a similar sound to Ozone 4, or you may find that one of the new modes better suits your mix. If you are using Ozone 5 Advanced, try adjusting the Early Reflections and Crossmix controls to see how they might enhance your previous settings.

Harmonic Exciter

We have updated all the algorithms used by the Harmonic Exciter. While each mode has been significantly improved from Ozone 4, you may find that the Amount controls need a slight adjustment to recreate your previous sound. In the Retro and Tape modes higher frequencies are often excited a bit more subtly in Ozone 5 than in Ozone 4, so you may need to turn the Amount up slightly in these cases. When using Tube mode in Ozone 5, you may find that lower frequencies are excited more than in Ozone 4's Tube mode. We feel the updated mode more accurately represents circuits using a vacuum tube, however you may need to turn the Amount down a bit on these frequencies. While in the Harmonic Exciter, be sure to try the new Oversampling mode to see how it enhances the Harmonic Exciter's effect. And if you are using Ozone 5 Advanced, try one of the new Triode modes for more pronounced tube excitation.

Dynamics

All Dynamics settings from Ozone 4 will carry over to Ozone 5. However, be sure to try out some of the new Dynamics features on you preset. Experiment with Soft Knee mode for more transparent compression. Try using Upward Modes in different stages of the dynamics process. If you are using Ozone 5 Advanced, see how the different Detection Filter settings can better address the needs of your mix.

Stereo Imaging

All Stereo Imaging settings from Ozone 4 will carry over to Ozone 5. Check out the new Vectorscope views though for more informative representations of the stereo image of your mix. If you're using Ozone 5 Advanced, try using the Stereoizer feature for monocompatible stereo enhancement.

Maximizer

All Maximizer settings from Ozone 4 will carry over to Ozone 5. If you are doing very aggressive limiting, try out the new Intelligent III mode for aggressive limiting without detectable distortion. If you are using Ozone 5 Advanced try applying Transient Recovery or reducing the Stereo Linking for limiting that is specifically tailored to your mix.

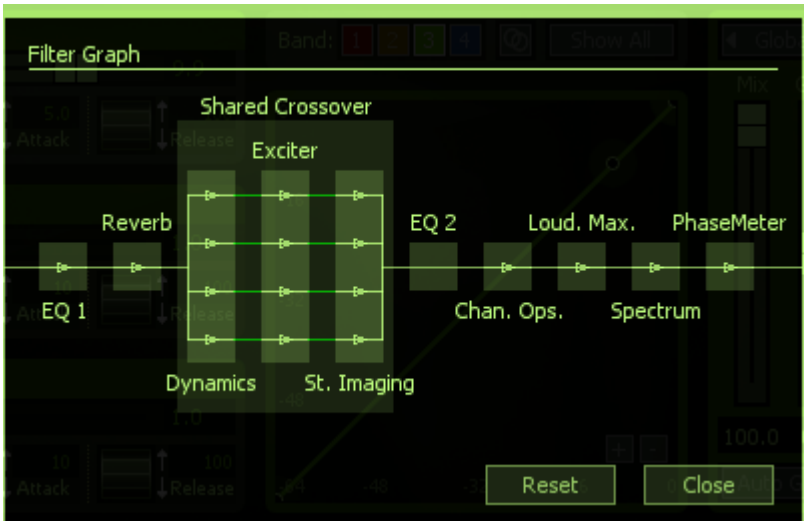
General Functions
Setting the Order of the Mastering Modules

By default, the order of processing is the order listed below (the signal passes through the Equalizer, then the Reverb, etc.). The phase and spectrum meters are based on the final output signal (after all processing).

- Equalizer
- Reverb
- Dynamics
- Harmonic Exciter
- Stereo Imaging
- Equalizer
- Maximizer

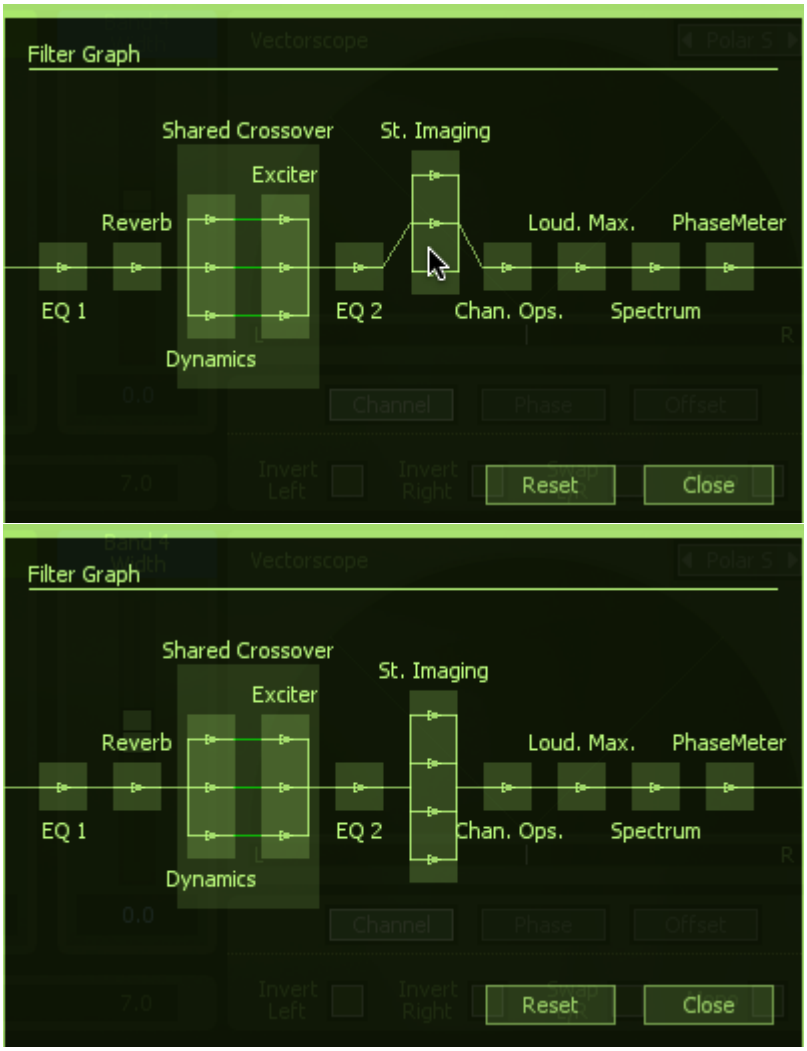
You can change the ordering of the processing by clicking on the Graph button.

Filter Graph
This provides a signal path flowchart of the current settings. You can modify the order by selecting a module and dragging it with the mouse to a new position. You can also place the spectrum and phase meters at any place within the processing, if for example you'd prefer to see a spectrum of the audio going into the EQ as opposed to seeing the spectrum after equalization.



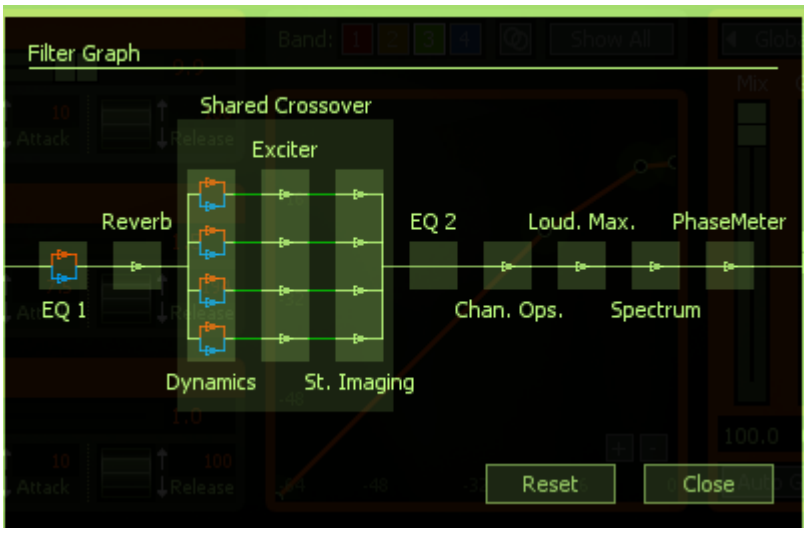
Crossover Settings
Ozone 5 allows for each multiband module to have independent crossover settings or share crossover settings with other modules. The three multiband modules, Dynamics, Exciter, and Imager, default to all sharing one crossover. This is represented in the Filter Graph by the Shared Crossover block. However, if they are dragged outside of this block, their

crossover settings may be set independently. Below you see that the Stereo Imaging module has been removed from the Shared Crossover and is using four-band processing while the shared crossover is using three bands.



Mid/Side Modes

When a module is processing in Mid/Side mode, this will be reflected in the filter graph by showing the signal split into orange (Mid) and dark blue (Side) paths. Below the first equalizer and the dynamics module are processing in Mid/Side mode.

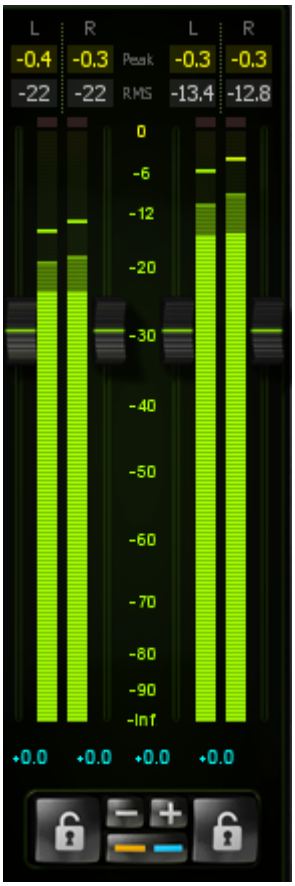


Close: To apply the new signal order, click on the Close button.

Reset: If you want to reset to the default order, click the Reset button.

Input and Output Gain

The panel on the right side of the Ozone interface is the main input/output section for Ozone. This is used for setting and monitoring gain levels going into and coming out of Ozone.



Setting Input and Output Gain

You can adjust the input or output gain by sliding the faders with the mouse, either by clicking and dragging or clicking and using the wheel of a wheel mouse. You can also use keyboard shortcuts to adjust the level in small increments.

Adjusting Left and Right Channels Independently

By default, the left and right gains are linked so moving one moves the other. You can adjust left and right gain independently by clicking on the "lock" icon. You can offset the two channels and then "relock" them, so that later adjustments move both channels by the same amount.

Faders will remember their offset even if they are temporarily turned up or down all the way, so that when you bring the faders back to the middle the offset will be preserved.

Double-click to Reset Faders

If the left and right faders are locked, double clicking on either fader will reset both of them to 0 dB. If the left and right faders are unlocked and set at different levels, double clicking a specific fader will reset it to 0 dB. If the left and right faders are locked but had been previously been set to different levels, double clicking on a fader will reset it to match the level of the other fader. Another double click will reset both faders to 0 dB.

Setting the Scale of the Meters

You can further customize your metering by adjusting the scale of the input and output meters. Clicking the (+) sign below the meters will increase the zoom or resolution of the metering scale, and clicking the (-) sign will decrease or zoom out the resolution of the metering scale.

Setting the Source of the Meters

The small orange and blue button below the meter allows you to choose the source of the input/output meters. When engaged the meters will display the Mid/Side levels and when off (default) the meters will display Stereo (left/right) levels.

More Information

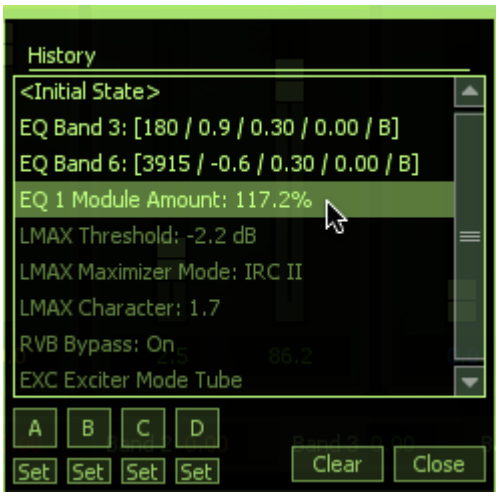
Right-clicking (under OS X you can also ctrl-click) on the level meters provides an options screen for the level meters.

You can set a gain offset for when Ozone is bypassed, to compare the sound when Ozone is on and off with a relative increase in volume to help you objectively preview Ozone's processing with matched gain when Ozone is bypassed.

Undo and History Comparisons

The History window is a unique and powerful feature for comparing settings in Ozone. To access the History list, click on the History button.

As you tweak controls, each movement is captured and displayed in the History list. To go back and hear a previous setting, simply click on the list at the point you want to audition. The changes that you've undone will show up in a lighter color. In the screenshot below, all changes after the Equalizer module amount was increased to 117.2%, etc. are undone.



Clear button: You can also press the Clear button to clear the history list at any time.

Close button: If you close the History window, processing resumes from the point you had last selected, so you can continue building on the History list from a earlier point.

A,B,C,D buttons: You can assign up to four points in the History list to A, B, C and D buttons. To do this, select the point in the list you want to capture, and click on the "Set" button below the A, B, C or D button. Clicking on the appropriate button will then recall the setting assigned to that button.

History Depth: The history list has a depth setting which controls how many edits it remembers. You can change this setting in the General Options tab .

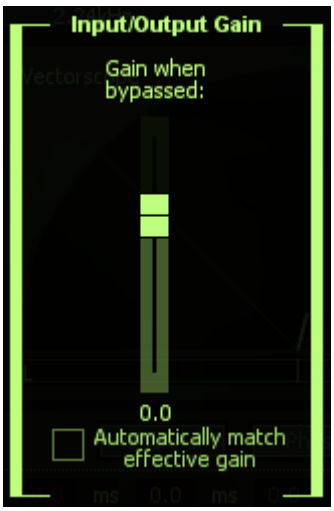
When you exit Ozone, the History list and any settings assigned to the A, B, C or D buttons will be saved to the file iZOzone3.hst in the directory where you installed Ozone. The next time you start Ozone, the list will be remembered so you can pick up right where you left off.

While using Ozone, you can press Ctrl+Z repeatedly to undo edits you've made, and Ctrl+Y to redo edits. See Shortcut Keys and Mouse Support for more keyboard shortcuts.

Gain when Bypassed Function

If you right click on the input/output level meters the dialog box below is displayed. There is a useful feature in this dialog called "Gain when bypassed". It allows you to set a gain that is only applied when Ozone is bypassed.

Note: Ozone's input/output meters typically don't run when Ozone is bypassed, but if Ozone is applying gain when bypassed, the I/O meters will keep working as a reminder that Ozone is still "processing" the audio.



Gain when bypassed

When Ozone is on there are many modules such as the multiband dynamics and loudness maximizer that can affect the overall or perceived level of the mix. This makes it very hard to compare "Ozone on" to "Ozone bypassed".

"Gain when bypassed" solves this problem. You can bypass Ozone and set this gain so that when you A/B Ozone on and off the apparent volume is the same. This is the only processing that is applied when Ozone is bypassed, and it is of course only applied when Ozone is bypassed.

Automatically match effective gain

When the "Automatically match effective gain" feature is engaged, Ozone determines how much gain is being added by all of the active Ozone modules and then automatically adds this amount of gain when Ozone is put into bypass mode.

Note: This may not work if you use the host application to bypass Ozone. If the host application reports that it is bypassed, it will work and we will automatically depress the Bypass button in Ozone accordingly. If the host does not report that it is bypassed, Ozone doesn't know and therefor cannot apply the "gain when bypassed".

Buffer Size Viewer

The Buffer Size Viewer dialog lets you inspect the buffer sizes which your host application is using.

If you are using Ozone at low latencies, you may experience unusually high CPU usage. Ozone allows you to tweak several buffer sizes in order to optimize CPU usage for your host application settings. Some host applications make it very easy to see what your buffer sizes are, but it can be more difficult to determine in others. For that reason, Ozone provides this dialog to let you find out exactly what buffer sizes are being sent to the plug-in.

To use this dialog, simply launch it by clicking the View Buffers button on the General tab of the Options screen. Then use the following controls:

Captured buffer sizes: This list-box shows the buffers you have captured thus far. The number on the left is the input buffer size, and the number on the right is the output buffer size. Note that the input and output buffer sizes will be equal in Pro Tools, VST, AU and MAS versions of Ozone, but in the DirectX version if delay compensation is enabled then the sizes may differ. When tweaking buffer sizes, you're interested in the number on the left, which is the host application's buffer size.

Start/Stop: Push Start to begin capturing buffer sizes. Now each time a buffer is sent to the plugin, it will be added to the list of captured buffer sizes for you to see. Push Stop to stop capturing buffer sizes. Note that buffers are sent in very rapid succession to the plug-in, and after 100 buffer sizes are captured, the capturing will automatically be stopped.

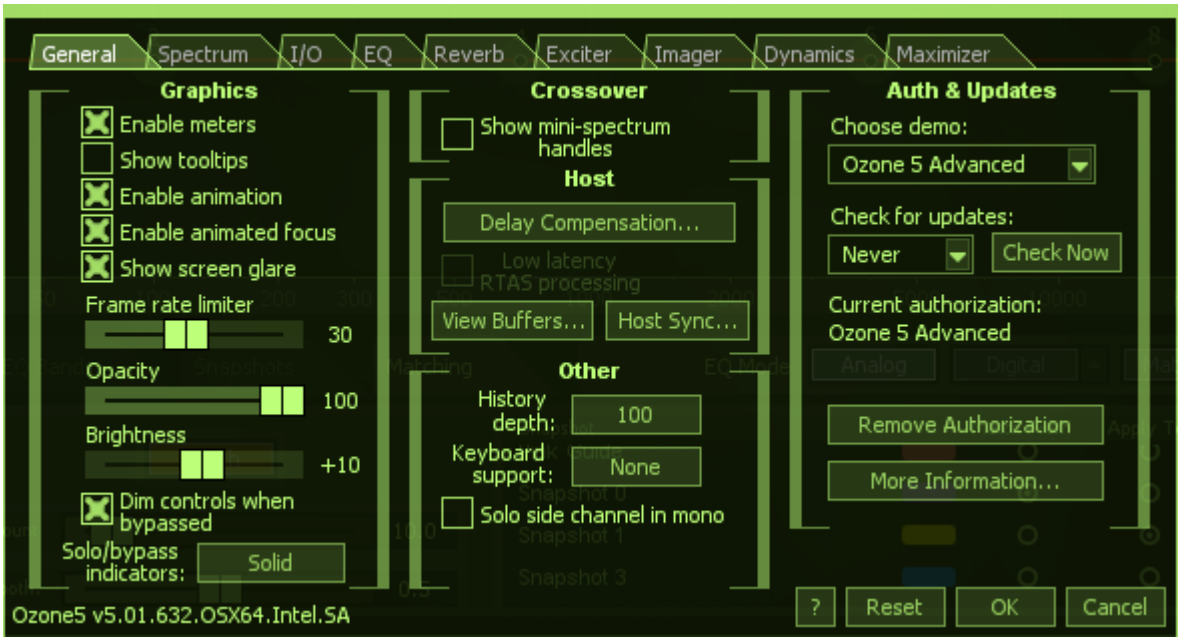
Clear: Clears the list of captured buffer sizes.

Copy: Copies the list of gathered buffer sizes to the Windows clipboard, useful for pasting into a support e-mail if necessary.

See Buffer Sizes for more info.

Options
General Options

The General tab lets you configure general Ozone properties to improve Performance, Automation, Graphics, and Buffering as well as authorize Ozone. These properties are displayed in the table below.



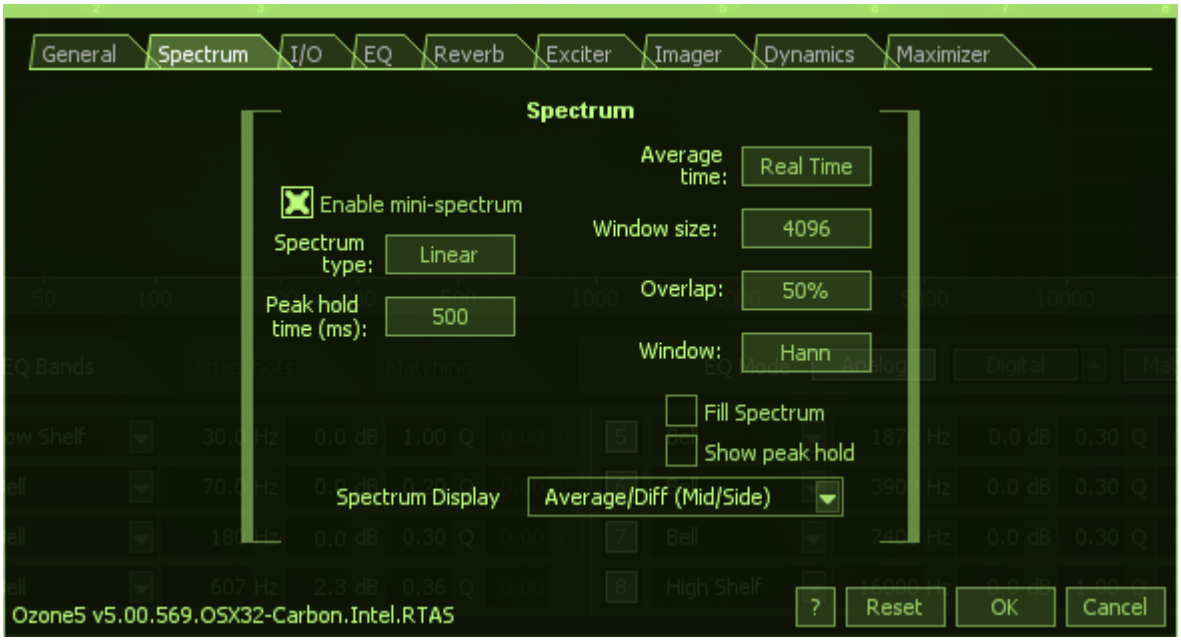
Graphics	
Enable meters	Although each meter has its own options, this option allows you to quickly turn on/off all meters.
Show tooltips	When enabled this allows informational notes to appear when the cursor/pointer is hovering on top of the features' controls
Enable animation	Allows you turn on/off the animated appearance of dialog boxes.
Enable animated focus	Allows you to turn on/off the animated white brackets which indicate the control where keyboard commands are sent.
Show screen glare	Toggles the visibility of the glare layer on top of Ozone's interface.
Frame rate limiter	Allows you to set the speed (frames per second) that Ozone should use to display and update meters. In most cases the default will provide smooth displays while still allowing adequate processing time for audio. If your PC hardware allows it, you can increase the frame rate for smoother animation. On the other hand, if you are running Ozone on slower hardware or notice graphics performance problems in your host application, you can set the FPS value lower to limit the amount of CPU Ozone uses for

	drawing.
Opacity	Allows you to control the opacity or transparency of the Ozone UI. This is helpful when working with automation, for example, to be able to have the Ozone UI in front but be able to "see through it" to the automation curves on the track view of the host app. Setting partial transparency does require additional CPU, but there is no CPU penalty when opacity is at 100% (i.e. the feature is not being used). If you find this feature useful, be sure to note the keyboard shortcuts for it. The slider will be disabled in host applications that do not support this feature.
Brightness	Allows you to control the overall brightness of the Ozone user interface. This allows you adjust the look of the UI to be more viewable on various monitors and in various venues.
Dim controls when bypassed	When this option is enabled, each module's controls will be dimmed when the module is bypassed. Modules can be bypassed in several ways: global bypass, module bypass, crossover band bypass, and mid/side channel bypass. This feature helps to remind you when a module is bypassed, so that you don't make adjustments to a bypassed module unintentionally.
Solo/bypass indicators	Allows you to set the behavior of the Solo/bypass indicators. Options are Blinking red, Solid red, or None.
Crossover	
Show mini-spectrum handles	Provides the option of turning on or off the horizontal handles (white lines) that appear in the mini-spectrum while adjusting multiband controls.
Host	
Delay compensation	Using some of Ozone's more CPU intensive settings and algorithms may result in a delay of the signal. That is, Ozone needs some time to "work on" the audio before it can send it back to the host application. That time represents a delay when listening or mixing down. Fortunately, many applications provide "delay compensation" which is a means for Ozone to tell the application it has delayed the signal, and the host application should automatically delay every other track in your session to align. If your host application supports delay compensation, enable this option. If your application doesn't support Ozone's delay compensation feature, or skips/stutters with this option turned on, you can manually correct the delay offset in the host application (i.e. manually edit out the short delay of silence). To help you perform manual correction, the delay Ozone introduces is shown below "Total System Delay" in both samples and milliseconds.
Low Latency RTAS Processing	This option only appears in the RTAS version of Ozone and by default will be disabled. When selected this option will help reduce latency in Pro Tools, but will cause higher CPU usage.
View Buffers	This launches the View Buffers dialog, which lets you inspect the buffer sizes which your host application is using. See Buffer Sizes documentation for more info.

Host Sync	This launches the Host Sync Viewer window which displays information about your current session/host application including Tempo, Transport State, Time signature, etc.
Other	
History depth	Lets you set how many levels or steps are remembered in the History dialog to control the size of the history log file.
Keyboard Support	Keyboard support must be set to full for all Keyboard shortcuts to be available. Available options include Full (full keyboard support), Minimal (only TAB, arrow keys, and ENTER), or None (Keyboard shortcuts turned off).
Solo side channel in mono	When mid/side processing is active and the side channel is solo'd, this option determines whether you hear the side channel as it is (L/R channel are inverted with respect to each other) or in mono.
Auth & Updates	
Choose Demo	Allows you to select between using Ozone 5 and Ozone 5 Advanced when in demo or trial mode.
Check for Updates	Selects the frequency with which Ozone 5 looks for version updates. Choose between daily, weekly, monthly, and never.
Check Now	Instantly checks if your version of Ozone is currently up to date.
Solo side channel in mono	This features enables a gentle crossfade for smoother transitions when toggling Ozone's Global Bypass control.
Remove Authorization	Removes the current authorization of Ozone and can be used to re-authorize Ozone from Basic to Advanced versions.
More Information	Directs to the supporting documentation for authorization.

Spectrum Options

The Spectrum tab lets you control Ozone's spectrum meters. These controls are listed in the table below.

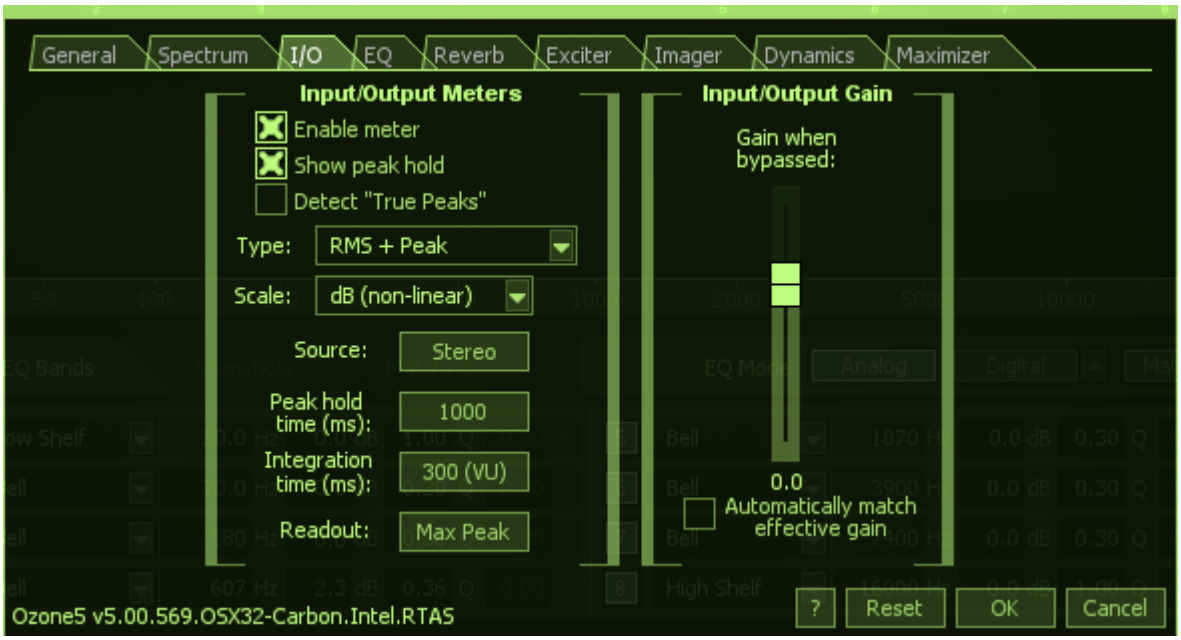


Spectrum Options	
Enable mini-spectrum	Turns on or off the spectrum meter that appears on top of multiband modules.
Spectrum type	Lets you select between four types of spectrums: **Linear:** a continuous line connecting the calculated points of the spectrum **1/3 octave:** splits the spectrum into bars with a width of 1/3 of an octave. Although the spectrum is split into discrete bands, this option can provide excellent resolution at lower frequencies. **Full Octave:** splits the spectrum into bars with a width of one full octave. **Critical bands:** splits the spectrum into bands that correspond to how we hear, or more specifically how we differentiate between sounds of different frequencies. Each band represents sounds that are considered "similar" in frequency.
Peak hold time	You can click on the Peak Hold time to select between specific hold times in milliseconds, or Infinite, where the peak is held indefinitely. You can reset the peaks by clicking on the spectrum.
Average time	Averages the spectrum according to this setting. Higher average times can be useful for viewing the overall tonal balance of a mix, while shorter average times provide a more "real time" display.

Window size	Controls the trade off between frequency and time resolution in the spectrum. Higher values will let you see smaller peaks in the spectrum, but the spectrum will update more slowly.
Overlap	Controls how often the spectrum updates. More overlap will cause the spectrum to update more frequently, at the expense of increased CPU usage.
Window	Selects a window type for the spectrum. In most cases the default window type will work well, but you can choose from a variety of window types. Each window type has different amplitude and frequency resolution characteristics.
Fill Spectrum	Allows you to display the real-time spectrum as a solid graph as opposed to a line graph. This option can be used to differentiate the real-time spectrum from the peak hold spectrum.
Show Peak Hold	Toggles whether Ozone displays and holds the peaks of the spectrum.
Spectrum Display	Lets you select the following spectrum displays: **Follow EQ** – displays information consistent with what mode of EQ processing you are working in. Stereo Average spectrum when working in Stereo mode, Left/Right spectrum when working in Left/Right mode, and Average Difference when working in Mid/Side mode. **Stereo Average (Mid)** - displays the centered mono or "mid" information **Stereo Difference (Side)** - displays the spatial or side information **Average/Diff (Mid/Side)** - juxtaposes the center signal information with the spatial signal information. **Left/Right** - juxtaposes the left and right channel information **Stereo Maximum** - displays the right and left channels superimposed as one spectrum and can be used when processing in Mid/Side side and wanting to solo Side information **Hybrid Stereo Width** - displays the mid channel information superimposed on a display of the difference between the mid and side information expressed in decibels

I/O Options

The I/O tab lets you control Ozone's input/output meters and gain when bypassed.



Input/Output Meter Options	
Enable meter	Turns on or off the level meters
Show peak hold	Turns on or off the peak hold display for the level meters
Detect "True Peaks"	This examines the levels of the analog signal that will eventually be produced by D/A conversion, as well as the levels of each digital sample (inter-sample peaks). An analog signal's peak level can exceed its corresponding digital signal's peak level by more than 3 dB!
Type	Allows you to set the type of metering used for Ozone's I/O meters. Available options include RMS, Peak, RMS+Peak, and K-System. See the Input and Output Meters page for info about metering options.
Scale	The available options for scale are dependent on the type of meter selected. For RMS, Peak, and RMS+Peak you can choose between dB (linear) and dB (non-linear). For K-System metering options include K-12, K-14, and K-20.
Source	The Source of the meter can be either Stereo of Mid/Side.
Peak hold time	If peak hold is on, clicking this button allows you to cycle through different peak hold times. The choices are 5 ms, 250 ms, 500 ms, 1000 ms, 5000 ms, and infinite. If set to infinite, the peak value will be held until you double click on the meter.
Integration time	This setting only applies if the level meter displays RMS. It lets you specify

	the integration time for the RMS calculation. In most RMS meters, the integration time is set to around 300ms.
Readout	Allows you to control what is displayed by the numeric display on top of the meters: peak or actual (real time). If set to "Max Peak", the display will reflect the meter's highest peak value encountered during processing. If set to "Current", the display will reflect the meter's current value of the level. If there are two levels displayed (Peak+RMS), we read the RMS value.
Gain when bypassed	See the Gain When Bypassed Function page for info about the gain when bypassed feature.
Automatically match effective gain	When the Automatically match effective gain feature is engaged, Ozone automatically sets the amount of gain added when Ozone is in bypass mode.

EQ Options

The EQ tab lets you control Ozone's equalizer module options.

Equalizer Options	
Freq. Res	This controls the resolution of the EQ when used in the Digital or Matching modes. Higher filter sizes will result in more precise frequency resolution, at the expense of more CPU.
Buffer size	Sets the buffer size for the Digital and Matching EQ. See Buffer Sizes for more info.
Soft Saturation	Turns on an algorithm which will gradually rolloff the level through EQ bands if they start to saturate. Ozone can accurately process signals with extended dynamic ranges and you can leave this off in most cases. The exception would be if you had reordered the modules so that the Paragraphic Equalizer was the absolute last process in the chain, in which case this option can soften any clipping that occurs in the EQ before being sent to the output.
Link EQ curve and info panel selections	When enabled, the EQ curve's selected band will automatically update when changes are made in the info panel. This makes it easy to find which band you're changing in the info panel. Also, when you change the active band by clicking on the EQ curve, the focus will move to the new active band.
Alt-Solo Filter Q	Allows you to set the default Q or width of the filter that is activated when Alt-clicking on the Paragraphic Equalizer.
Analog Matching	When enabled, the EQ filter shapes are more closely matched to their analog prototypes than conventional digital designs that exhibit warping at

	high frequencies.
Show Legend	Shows the EQ legend for frequency response curve colors
Show Extra Curves	When enabled, new curve options may be viewed. This allows you to view Phase Delay, Phase Response, and Group Delay. **Phase Delay** – A calculation of phase response represented in time (ms). This curve is useful in all equalization modes. **Phase Response** – A calculation of phase response represented in degrees. This curve is most useful when using analog or minimum phase equalization. **Group Delay** – A calculation of the delay of amplitude envelopes in time (ms) This curve is most useful when working with transients.
Show Scale Grid	Underlays a grid representing frequency and level in the spectrum window.
Spectrum Options	
Enable EQ Spectrum	Turns on or off the spectrum meter in the Equalizer module.
Show Hz/dB readout	Allows you to display a continuous readout of the mouse position (in Hertz and decibels) when in the Equalizer module.
Show musical units	Allows you to display frequency labels as notes (for example, A 4) in addition to Hz.

Reverb Options

The Reverb tab lets you control Ozone's reverb module options.

Reverb Options	
Room reverb buffers	Sets the buffer size for the reverb. See Buffer Sizes for more info.

Exciter Options

The Exciter tab lets you control Ozone's exciter module options.

Exciter Options	
Number of bands	Allows you to set the default number of bands available in the Exciter module. (up to 4)
Crossover type	Selects between a digital linear phase crossover, an analog crossover, and Ozone's Hybrid crossover. The digital crossover provides a more transparent sound, while the analog crossover option provides a natural analog character. The Hybrid crossover is a perfect reconstruction IIR analog crossover designed to reduce phase distortion and frequency distortion found in other analog crossovers while maintaining precise crossover points and the warm characteristics of analog crossovers.
Crossover buffer size	Sets the buffer size for the digital crossover. See Buffer Sizes for more info.
Crossover Q	Adjust the bandwidth or Q of the digital crossover filters. A higher Q results in tighter crossovers, while a lower Q provides a more gradual transition from one band to the next.

Imager Options

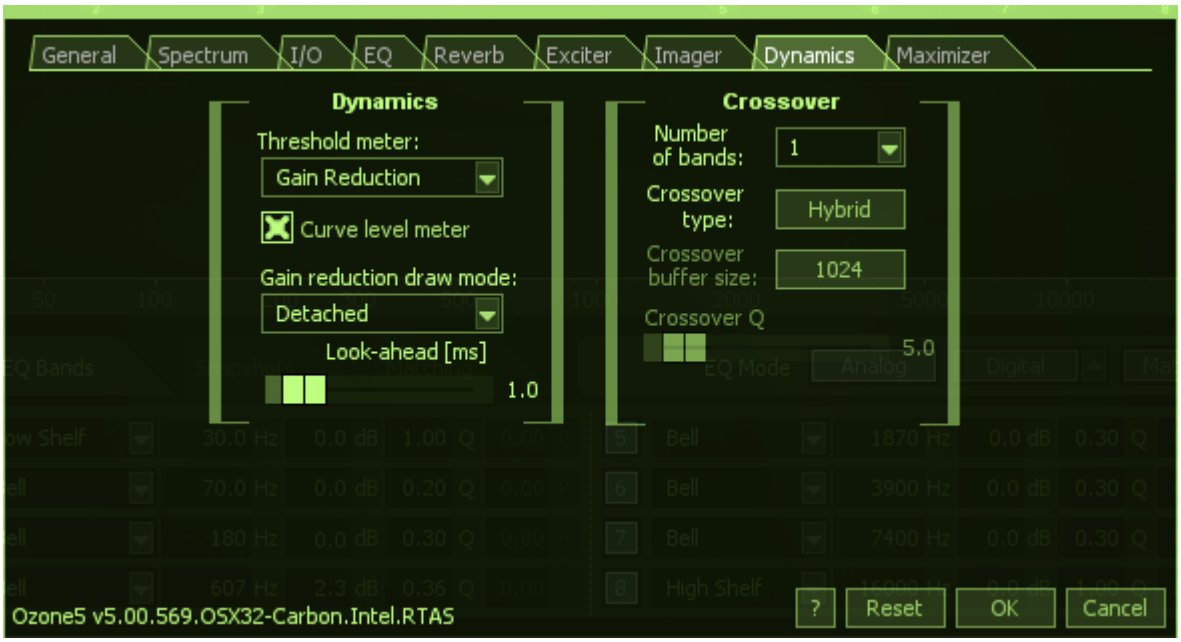
The Imager tab lets you control Ozone's imager module options.

Imager Options	
Enable ticker correlation meter	Turns on or off the ticker correlation meter.
Tickertape correlation smoothing	Adjusts the aggressiveness with which the tickertape correlation meter draws curves.
Phase Meter	
Prevent antiphase	Prevents mono compatibility problems when widening the stereo image.
Show correlation meter history	Turns on or off the history which the correlation meter "paints" as it updates.
Enable vectorscope	Turns on or off the vectorscope meter.
Show vectorscope history	Turns on or off the history which the vectorscope "paints" as it updates.
Normalize vectorscope	When enabled, the vectorscope automatically applies gain to its input in order to make it fill the entire display. When disabled, quieter signals will appear smaller on the vectorscope display.
Enable correlation meter	Turns on or off the correlation meter in the Stereo Imager module. The correlation meter shows the similarity between the left and right channels.

Enable balance meter	Turns on or off the balance meter in the Stereo Imager module. The balance meter shows the overall balance between the left and right channels.
Vectorscope Detection Method	When in Polar Level mode, this determines how the sample averages are detected. Selects between Peak, RMS, and Envelope. Envelope mode can be most useful when analyzing amplitude as it detects even levels across all frequencies.
Crossover	
Number of bands	Allows you to set the default number of bands available in the multiband modules. (up to 4)
Crossover type	Selects between a digital linear phase crossover, an analog crossover, and Ozone's Hybrid crossover. The digital crossover provides a more transparent sound, while the analog crossover option provides a natural analog character. The Hybrid crossover is a perfect reconstruction IIR analog crossover designed to reduce phase distortion and frequency distortion found in other analog crossovers while maintaining precise crossover points and the warm characteristics of analog crossovers.
Crossover buffer size	Sets the buffer size for the digital crossover. See Buffer Sizes for more info.
Crossover Q	Adjust the bandwidth or Q of the digital crossover filters. A higher Q results in tighter crossovers, while a lower Q provides a more gradual transition from one band to the next.

Dynamics Options

The Dynamics tab lets you control Ozone's Dynamics module options.



Dynamics Options	
Threshold Meter	Selects whether the Threshold Control displays a level histogram meter or a gain reduction meter.
Curve level meter	Allows you to turn on or off the dynamics curve level meter.
Gain Reduction Draw Mode	Selects whether the gain reduction meters in the Threshold Control are detached or attached to the level meters.
Look-ahead	Adjusts the amount of look-ahead the dynamics module is using to allow for smoother gain changes.
Crossover	
Number of bands	Allows you to set the default number of bands available in the multiband modules. (up to 4)
Crossover type	Selects between a digital linear phase crossover, an analog crossover, and Ozone's Hybrid crossover. The digital crossover provides a more transparent sound, while the analog crossover option provides a natural analog character. The Hybrid crossover is a perfect reconstruction IIR analog crossover designed to reduce phase distortion and frequency distortion found in other analog crossovers while maintaining precise crossover points and the warm characteristics of analog crossovers.
Crossover buffer	Sets the buffer size for the digital crossover. See Buffer Sizes for more info.

size	
Crossover Q	Adjust the bandwidth or Q of the digital crossover filters. A higher Q results in tighter crossovers, while a lower Q provides a more gradual transition from one band to the next.

Maximizer Options

The Maximizer tab lets you control Ozone's Maximizer module and Dither options.

Maximizer Options	
Threshold Meter	Selects whether the Threshold Control meter displays a level histogram meter or a gain reduction meter.
Gain Reduction Draw Mode	Selects whether the gain reduction meters in the Threshold Control are detached or attached to the level meters.
Dithering	
Enable DC offset meter	Turns on or off the DC offset meter.
Enable bit meter	Turns on or off the bit meter.
Show peak hold	Turns on or off the peak hold for the bit meter, meaning the outer column of bits that remain lit when that bit is toggled.
Peak hold time	Allows you to set a time for the bits to be held before they are reset and recalculated from the real time bit meter columns.

Tips and Shortcuts
CPU Optimization

Unlike many single task plug-ins Ozone 5 harnesses the power of six plug-ins in one. Ozone performs a significant number of calculations when running. The combination of multiple DSP modules performing analog modeling and a half dozen real time meters dictates that it requires more CPU processing than a typical plug-in. While continuing to push the limits of high quality audio signal processing, Ozone 5 offers significant improvements concerning CPU optimization allowing your sessions to run more efficiently.

If you do start to reach the limits of your particular machine, here are some tips for optimizing your CPU:

- If you're not using modules for processing, you should be sure to bypass them to conserve CPU power.
- If you're using Ozone's Digital EQ, Digital Crossover, or Reverb, you should adjust your buffer sizes for optimal performance. See Buffer Sizes for details.
- Try changing the buffer size and/or latency setting in your host application. When buffers are too high (latencies are too large), meters will update very slowly and performance may suffer. As buffers become very small (latencies are very low), the Digital EQ, Digital Crossover, and Reverb will consume more CPU.
- You can disable meters in their option screens. Right click on any meter to bring up the options screen for that meter.
- Using fewer crossover bands can save significant CPU. Try using 1 or 2 band dynamics, for example, instead of all 4 bands. See Using Multiband Modules for instructions on how to change the number of crossover bands.

• If you are using Ozone 5 Advanced and are using less than four modules, try using the modules as individual component plug-ins to reduce CPU.

Buffer Sizes

Ozone 5 contains advanced controls to help you get the optimal performance for your setup. Since Ozone contains several modules within its internal DSP chain, there are several places where you can control its internal buffer sizes. In general, the default values should give good performance on most systems, but there are some aspects of host applications that are not detectable by plug-ins. Read this section for instructions on how to optimize Ozone for your particular setup.

Setting buffer sizes for independent modules

Some of Ozone's DSP modules required fixed buffers when set to certain modes. These include Ozone's Digital Equalizer, Digital Crossover and Reverb. You can set the buffer size for each of these modules independently using the EQ/Reverb/Crossover options tab. These buffer sizes default to reasonable values, and most users should be able to use Ozone right away without tweaking them.

How to decrease CPU usage

If you experience unusually high CPU usage, you can try changing the Digital EQ to Analog mode and the Digital Crossover to Analog mode. You can also try increasing your host application's buffer size to decrease CPU usage. We understand that these solutions might not be adequate for many users, so we've also designed Ozone to be optimized for any host application setup.

If you are using Ozone at low latencies and rely heavily on these DSP modules, you will want to adjust the buffer sizes to get Ozone's CPU consumption as low as possible. At first it may seem unintuitive, but if you follow the tips here then you should be able to tweak your buffers very quickly and easily.

Optimizing Ozone

To get the best buffer settings for your setup, first you should have an idea of what kinds of buffers your host application is sending. You can use Ozone's Buffer Size Viewer to do this. Once you know what size buffers your host application is sending, try the following:

- Place Ozone's equalizer in Digital mode, and bypass all modules except for the equalizer. Set the Digital EQ filter size to the size you most commonly use.
- Set the Ozone's Digital EQ buffer size to the number that's closest to your host application buffer size.
- Open a CPU meter. Many host applications have a CPU meter built-in, but if you're running Windows XP you can also press Ctrl+Shift+ESC and select the Performance tab. Note that CPU meters are usually somewhat inaccurate, but we're just looking for relative changes in CPU usage.
- Open an audio file with typical settings (sampling rate, bit depth, number of channels) for your use and play it through Ozone. If you usually use Ozone in a multitrack environment then be sure to do the same here. As the audio plays, try adjusting the Digital EQ buffer size and see what effect it has on CPU consumption. Buffer sizes near the host application buffer size are a good starting point, but the best choice depends on many aspects of your system and host application which are beyond Ozone's control.
- Once you have the best setting for the Ozone Digital EQ, try steps 1-5 for Ozone's Digital Crossover and Reverb. Be sure to test each DSP module in isolation to avoid complicating things more than necessary.

- Now Ozone's CPU consumption for this setup should be optimized. If you change the way you use Ozone, for example if you move from 44.1 kHz to 96 kHz, or you move from a single-track setup to a mulitrack setup, then you may want to repeat these steps to make sure your buffer settings are still optimal.

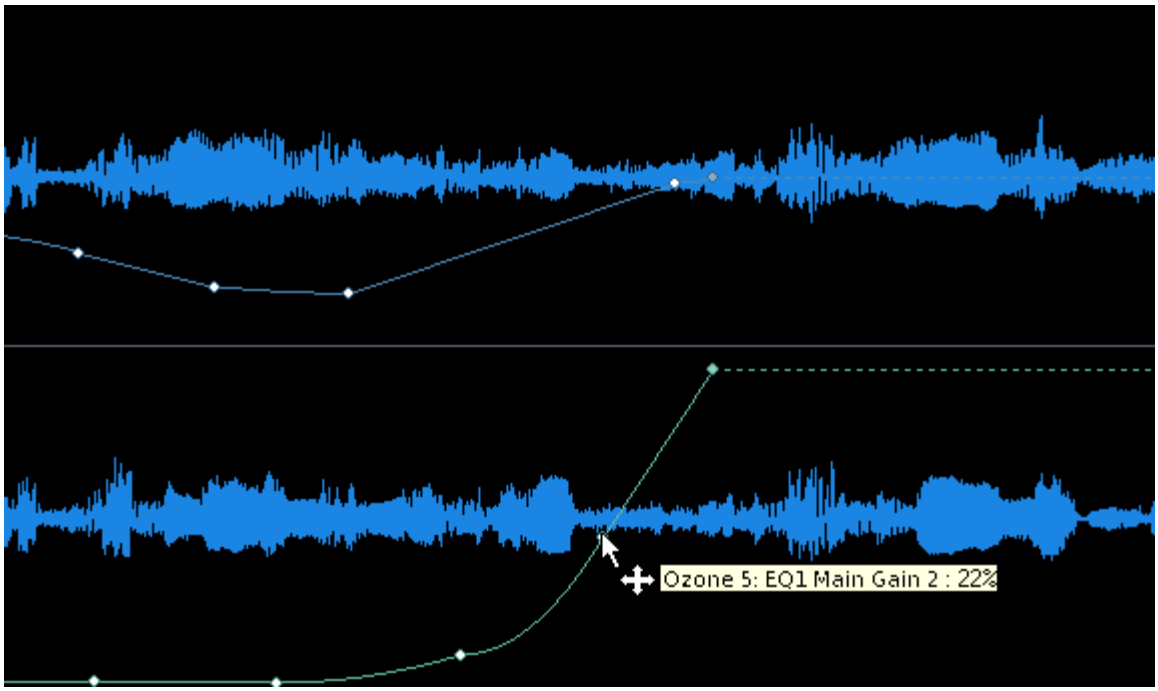
We've gone to great lengths to optimize Ozone's internal DSP without compromising sound quality. We hope these steps help make Ozone useful in a wide variety of setups. These steps should help you address those variables which are beyond our control and quite often very different for different users.

Automation

Automation allows you to specify changes to parameters over the duration of a mix - such as stereo widening during a chorus or boosting an EQ during a solo. You can automate more than 370 parameters in Ozone using host applications which support effects automation.

Using Automation in Ozone

The implementation and specifics of automation are dependent on the host application, so we refer you to the documentation of the host app for setting up an automated mix. In general, though, you patch Ozone as an ordinary effect on a track, then in the track view of the host app assign automation envelopes to it. These envelopes control how Ozone parameters are changed over the course of the mix. In this case, most of your "tweaking" is done in the track view of the host app, dragging curves and envelopes as opposed to changing controls in Ozone. For example, in the screenshot below we're adjusting the gain of an EQ band in Ozone from a host application's track view.



Notes specific to Ozone automation:

• Keeping track of all the parameters. We've done our best to provide the controls with intelligent names, but it can be overwhelming when you initially see the list of automatable parameters in Ozone. Don't panic. Scroll through the list, remember that each multiband module has up to 4 bands per parameter (e.g. you have high, high-mid, mid, mid-low, and low bands) and in the dynamics module each band can have three sections (limiter, compressor, expander). So, for example, "Dynamics: Comp Thresh Low-Mid" means in the Dynamics module, the compressor threshold (as opposed to the expander or limiter threshold), Low-Mid band.

• When automating parameters in the Equalizer module it is important to note that Left/Right and Mid/Side processing modes must be automated using the parameters labeled “Aux”. The parameters labeled “Main” are used to automate the Equalizer when it is processing in Stereo mode only.

• When you automate a control from the track view, you can see the control on the Ozone

interface move under the control of the host application. We purposely don't update the position of the control as often as we could. It takes CPU to redraw controls and it takes CPU to process audio. So we update the drawing of the control less frequently. Therefore, it may look like the control is moving in steps, but rest assured that the audio is being processed smoothly.

- When automating in a track view with envelopes, but working mainly with the Ozone interface, we found it helpful to be able to "see through" Ozone so you can monitor Ozone meters and controls but see the track view and automation curves behind Ozone. So we provide an Opacity slider in the main options dialog. This allows you to see through Ozone to monitor both what Ozone is doing and what is happening with the automation curves. Note that this is not available in all host applications, and it does require more CPU than a standard "opaque" plug-in if you set the Opacity to less than 100%.

Shortcut Keys and Mouse Support

Turn Keyboard Support On or Off

You can turn Keyboard Shortcuts On or Off from the General Options menu. Keyboard support must be set to Full for all Keyboard shortcuts to be available. Available options include Full (full keyboard support), Minimal (only TAB, arrow keys, and ENTER), or None (Keyboard shortcuts turned off).

Alt+click

If you Alt+click on the "active" light of a module on the faceplate that module is made active (on) and all other modules are bypassed.

If you Alt+click on the Bypass ("b") button of a multiband that band is solo'ed.

If you Alt+click on a module in the preset system that module is made active and the rest inactive.

Alt+clicking on most other controls will reset them to their default value.

Wheel Mouse Notes

If you have a wheel mouse, you can adjust most controls (I/O gain, sliders, etc.) by simply positioning the mouse cursor over the control and rolling the wheel. Hold CTRL to move in smaller increments and SHIFT to move in larger increments. If the wheel has no effect, try clicking on the plugin to make sure Ozone has the keyboard focus.

In the Paragraphic Equalizer, you can adjust the Q of a selected band or bands with the wheel.

In the Paragraphic Equalizer table (accessed with the "Show Info" button) you can adjust a value by holding the mouse over the value and rolling the wheel.

In the History screen, you can use the wheel to scroll through the History list.

Copy/Paste Support

Right-click (under OS X you can also ctrl-click) on any slider to bring up a context menu allowing you to copy and paste its value. You can copy/paste between sliders, even if the sliders are in different instances of the plugin. You can also copy/paste between a slider and a text editor such as Notepad or TextEdit in order to see the slider's value to a much higher precision than the plugin displays.

Mouse and Meters

You can zoom in and out on level meters and level histograms by holding down the Ctrl key under Windows or the Command key under OS X and clicking with the left mouse button to zoom in or the right mouse button to zoom out. Under OS X you can also Command-ctrl-click to zoom out.

You can reset the peaks or averaging of the spectrum by clicking on the spectrum.

You can reset a meter's peak indication by clicking on it. You can also reset a level meter's clipping indicator by clicking on the clipping indicator (the red "over" light at the top).)

Here is a list of Available Shortcut Keys

Front Panel	
Ctrl + 1 through 6	Display each of the six mastering module screens with the Ctrl key in combination with the 1-6 keys.

Ctrl + Shift + 1 through 5	Displays options dialogs: 1: General Options 2: Spectrum Options 3: I/O Options 4: EQ Options 5: Reverb Options 6: Exciter Options 7: Imager Options 8: Dynamics Options 9: Maximizer Options Note: If you are using a component plug-in, Ctrl + Shift + 4 will always take you to the options tab of the module you are using.
Ctrl + P	Toggles Preset Manager
Ctrl + B	Toggles bypass for all Ozone processing.
Mastering Modules	
Tab and Shift + Tab	Select the next or previous control. You can also select a control by clicking on it with the mouse. To select a slider without moving the slider, click on the slider label.
Home and End	Set the value of the selected control to its lowest or highest value, respectively.
Arrow keys	Turn the selected control up or down. Use with Shift key for larger increments. You can select a control by clicking on it. To select a slider without moving the slider, click on the slider label.
Page Up and Page Down	Turn the selected control up or down in larger steps. Use with Shift key for larger increments.
Enter	Toggles the value of a checkbox or button control if selected, or enters numeric entry mode if a fader is selected.
Space Bar	Toggles the value of a checkbox if selected.
Direct Entry	Note that you can enter a numeric value directly for a selected control by pressing Enter or clicking on the numeric value label, entering a new number, and pressing the Enter key.
EQ	
Alt + click	Apply a bandpass filter at the mouse cursor to "solo" the frequencies under the cursor
Ctrl + click (Windows) Command + click (OS X)	Selects multiple EQ bands to adjust them as one group

Shift + click	Constrain mouse movements (dragging an EQ band) in either the vertical or horizontal direction.
Double-click	Double click on a band to reset it to its default position. Double click anywhere in the spectrum without an active node to activate a node in that area.
Left/Right arrow keys	Adjust the frequency of a selected band or bands. Use with Shift key for larger increments.
Up/Down arrow keys	Adjust the gain of a selected band or bands. Use with Shift key for larger increments.
Alt + up/down arrow keys	Changes the fiilter type (bell, lowpass, highpass, etc.) for the selected band.
Alt + left/right arrow keys	Select the next or previous EQ band.
Ctrl + left/right arrow keys	Adjust the Q of a selected band or bands. Use with Shift key for larger increments.
Input/Output Gain	
Ctrl + - Ctrl + =	Increase the left and right input gain. Use with Shift key for larger increments
Ctrl + [Ctrl +]	Decrease the left and right input gain. Use with Shift key for larger increments
Ctrl + ; Ctrl + '	Increase the left and right output gain. Use with Shift key for larger increments
Ctrl + . Ctrl + /	Decrease the left and right output gain. Use with Shift key for larger increments
Ctrl + , Ctrl + \	Toggle locking the left and right input or output gains
Misc	
Ctrl + Z	Undo the last change made to a control.
Ctrl + Y	Redo the last change made to a control.
Alt + 0 through 9 or Ctrl + Alt + 0 through 9	Sets the opacity/transparency of the Ozone UI. 0 is fully opaque (not transparent at all). After that, 1 through 9 set increasing levels of opacity.
Esc	Cancels dialog boxes.

F1	Launch help for active module
F3	Toggle options dialog visibility
F4	Toggle filter graph visibility
F5	Toggle History visibility
F6	Resets active panel

iZotope Customer Support

How to purchase the full version of Ozone 5

If you are using the demo version of Ozone and would like the full version, you can purchase Ozone direct from the iZotope online store.

http://www.izotope.com/products/audio/ozone.

Once your purchase is complete you will be sent an e-mail confirmation and a full version serial number that can be used to fully authorize your current installation of Ozone.

iZotope Customer Support Policy

iZotope is happy to provide professional technical support to all registered users absolutely free of charge. We also offer valuable pre-sales technical support to customers who may be interested in purchasing an iZotope product. Before contacting iZotope support, you can search our Product Knowledgebase to see if the solution to your problem has already been published.

http://www.izotope.com/support/center

How to contact iZotope for Technical Support

For additional help with Ozone, please check out the support pages on our web site at http://www.izotope.com/support or contact our customer support department at support@izotope.com.

iZotope's highly trained support team is committed to responding to all requests within one (1) business day and frequently respond faster. Please try to explain your problem with as much detail and clarity as possible. This will ensure our ability to solve your problem accurately, the first time around. Please include all system specs and the build/version of Ozone that you are using.

Once your support request is submitted, you should automatically receive a confirmation email from iZotope support. If you do not receive this email within a few minutes please check your spam folder and make sure our responses are not getting blocked. To prevent this from happening please add support@izotope.com to your list of allowed email addresses.

International Distribution

Support is also available from our international distributors worldwide, for any customers who purchased their iZotope products through a certified iZotope distributor. Check with your local distributor for their availability. If you would like help locating your local distributor please contact iZotope support.

http://www.izotope.com/support

Thanks for using Ozone!

iZotope

- the iZotope team

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